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Table of Contents on page 4

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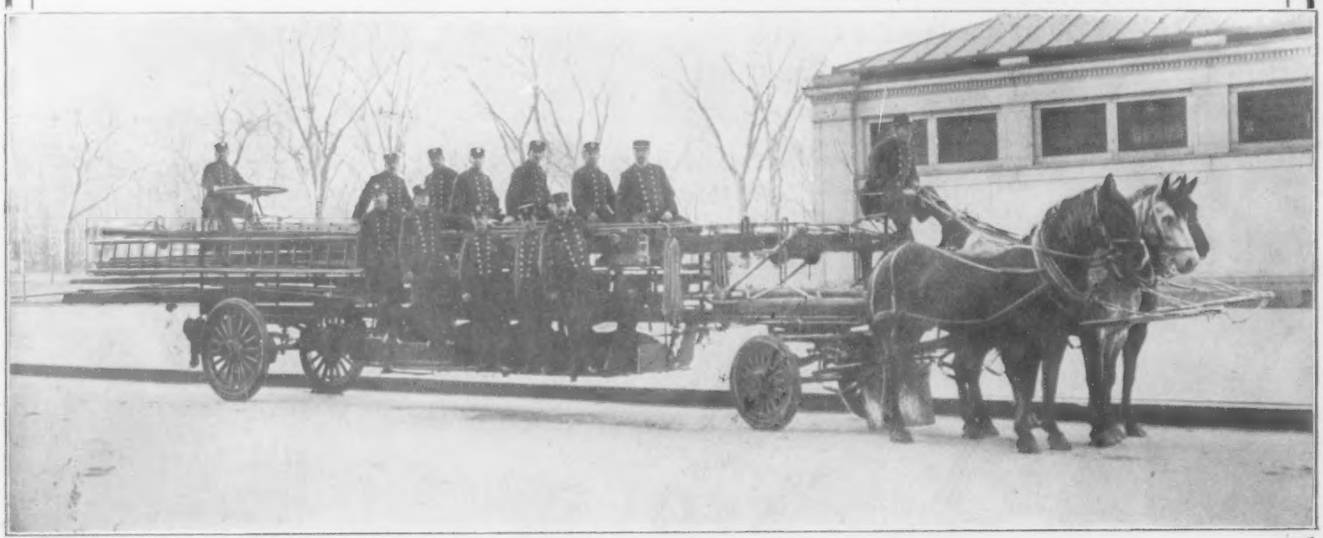

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VOLUME XII NEW YORK, MAY, 1902 No. 5

THE STREETS OF OLD NEW YORK

Development of Pavements—Street Signs and Public Baths Recommended—Establishment of Isles of Safety—Proposed Extension of the Riverside Drive

By Jacob A. Cantor

SINCE my installation as President of the Borough of Manhattan I have given more or less study to the streets and their conditions, as well as to some general questions affecting the appearance of the borough. For the paving of the 412 miles of improved streets within the limits of Manhattan Borough, various materials have been used, including granite, Belgian blocks, sheet and block asphalt, cobble stone, karri wood and macadam. There was a time, in the early history of this borough, when cobble stone pavement was looked upon as the best that could be laid. Its popularity soon waned, and now there is but a small fraction over a mile of this kind of pavement to be found within the limits of the borough. Belgian block next became popular. This was superseded by the granite block, which is still the most popular kind of pavement for the principal thoroughfares, especially for those used for heavy trucking and in the general business streets of the city. At the present time there are about nineteen miles of Belgian block pavement as compared with 147 of granite block. Macadam pavement has never been extensively used in this borough for the reason that while it is comparatively inexpensive to construct, it costs a large amount of money to maintain it in repair. Notwithstanding this fact it is the most popular kind of pavement for road driving, and during my administration committees have waited on me from the Road Drivers' Association, advocating the laying of this on roads frequented by them, rather than any other pavement. There are only twenty two miles of macadam road in the borough, and it is not likely that this mileage will be materially increased for some years to come.

JACOB A. CANTOR,
President, Manhattan Borough

OBJECTS TO ASPHALT FOR BUSINESS STREETS

Sheet and block asphalt next became popular, and there are more miles of asphalt pavement than of any other one kind, there being 183 miles of sheet and block asphalt pavement in Manhattan. This is said to be the most expensive in laying, but the cheapest in maintenance. It has been laid not only upon the busiest thoroughfares, but upon residence streets as well. Last year Broadway, from Canal street to Fourteenth street, was surfaced with sheet asphalt, and this year it will be extended from Canal street to the Battery. It is a noiseless and comparatively dustless pavement and will insure the peace and quiet of any neighborhood. It is not the best pavement, however, because it does not afford a sure foot-hold for horses. Its surface is exceptionally slippery and has given rise to a great deal of dissatisfaction particularly since it has been laid on Broadway, because of the many valuable horses that have been seriously injured by falling. The nuisance became so detrimental to the life and limb of both horse and man during the past winter that frequent appeals were made to have this pavement sanded so as to minimize the evils and perils of the smooth surface. I have determined, that so far as I am concerned, the asphalt pavement will only be laid in the future where it is demanded in residential streets or surrounding school houses, hospitals and similar institutions. It is a useful pavement in crowded tenement house districts owing to the fact that it can be easily flushed during the hot summer days and nights, and thereby reduce the oppressive temperature incident to the summer season. This makes asphalt pavement a decided boon to the dwellers in the congested districts.

GRANITE BLOCK BEST FOR HEAVY TRAFFIC

After a careful study of local conditions, as found within the limits of Manhattan, touching the character and growth of street pavements, I am convinced that after all the two best pavements are the granite block for the business sections and the asphalt for the other

SIXTH AVENUE NEAR 23D STREET, LOOKING NORTH—PAVED WITH ASPHALT

sections of the borough. By this I do not mean to express a technical or decided opinion as to the merits or demerits of any of the wooden or other pavements that are in use in other municpalities and villages. I have not yet had an opportunity since assuming my official duties to examine, or even cause to be examined, any of these other pavements, although some of them have been very highly recommended to me. The following table will show the different kinds of pavements now in use in the Borough of Manhattan, together with the several amounts in square yards and lineal miles:

	Sq. yards.	Miles.
Specification granite	3,045,739.17	139.04
Square granite	338,125.79	8.25
Specification trap	755,768.05	39.94
Belgian trap	781,138.09	18.61
Sheet asphalt	3,362,584.63	168.61
Block asphalt	273,574.78	14.36
Cobble	7,924.00	1.10
Karri wood	1,013.10	.08
Macadam	1,040,300.93	22.31
Totals	9,606,168.54	412.30

In addition to the street paving, which, of course, is exceedingly important, I have given much consideration to other matters which concern the health, comfort and convenience not only of the citizens of New York, but the visitors. There is no more pressing need before the administration at the present time than that which demands the immediate installation of street signs of a proper character and at the proper place on the street. At my suggestion a model has been prepared which will undoubtedly be adopted by the Municipal Art Commission, and if my recommendation is carried out the present disadvantages not only to the ordinary citizens, but more especially to the visitor, will be removed. It is a severe criticism on our great city that under present conditions it is impossible for a stranger to tell "where he is at" without consulting an officer or some one else. I hope also to be able to bring about a better system for numbering houses, so that the numbers can be readily seen by the passerby. This is quite as important as to have the names of the streets displayed in a conspicuous place.

STREET SIGNS AND PUBLIC BATHS

I am endeavoring to bring about the establishment of public baths. Many of the public-spirited citizens of New York have heartily co-operated with me in this matter, and already an elaborate report upon the subject, with plans, specifications and drawings for buildings, have been submitted to me for approval. Thus far it has been substantially agreed to build four of these large, public, all-the-year-round baths in the thickly settled sections of this borough. The experience of the Rivington Street Baths, which were opened a year ago, has demonstrated the wisdom of the erection of an additional number. It is astonishing how many of the poor people are willing to avail themselves of facilities for bathing when they are provided in this way. More than thirty thousand baths were furnished during the past winter to the people in the immediate neighborhood of the Rivington Street Baths. It will be readily appreciated that no greater sanitary or hygienic measure can be suggested for the improvement of the public health than the construction of these bath houses on scientific principles. They are in operation in all the leading cities of Europe greatly to the advantage of the poorer classes. They have also been introduced with satisfactory results in many of the smaller cities of the United States. They have been in use for a number of years in Albany, Rochester, Buffalo, Chicago, San Francisco and elsewhere.

BROADWAY LOOKING NORTH, SHOWING 14TH STREET AND UNION SQUARE

The public conveniences which are to be found in foreign cities like London, Paris and Berlin, are far more numerous than can be found on this side of the Atlantic. A beginning has been made, but it is my intention to multiply these means for public comfort during my term of office. In carrying out this plan, I have asked for, and shall undoubtedly receive the co-operation of the Rapid Transit Commission and societies of public-spirited women to provide suitable comfort stations in various parts of the borough, especially at the stations of the Rapid Transit Tunnel. In this connection correspondence has already been opened with the Mayor, and I am assured of every available means of co-operation at the disposal of the present administration.

WALL STREET LOOKING WEST TO BROADWAY

READY TO CO-OPERATE WITH MUNICIPAL ART SOCIETY

I am in perfect harmony with the ideas and suggestions made by the Municipal Art Society of this city, for the development of the æsthetic side of the municipality. Many plans have already been considered and some of them are looked upon as necessities. An endeavor is being made to co-operate with the Tree Planting Association so that our streets may not be so barren of trees. We shall not only put forward every effort to multiply the planting of trees, but also to save those which are already growing.

One of the absolute necessities now confronting us is the establishment at certain danger points along our thoroughfares of what are known as "isles of safety." The Municipal Art Society has come to our assistance in this matter and offered to conduct a competition which shall bring forth the best design that may be adopted to certain localities; for example, the first one will probably be located at the intersection of Broadway and Fifth avenue at Twenty-third street. It is hoped that before the year is out this "isle of safety" will be completed at the point mentioned. The need of such a provision has long been felt. An effort will also be made to regulate sky signs and general advertising signs as displayed on buildings and around the city, in order to get rid of the hideous appearance which the indiscriminate use of signs has forced upon us. An ordinance has been introduced in the local Assembly which attempts to regulate this matter. If the provisions of the ordinance are carried out faithfully the general appearance of Manhattan Borough cannot fail to be improved.

During the next twelve months the Riverside Drive, which terminated a few hundred feet north of Grant's Tomb, will probably be extended to connect it with the Boulevard Lafayette, or French Boulevard, as it was called. The consummation of this project will bring about the realization of a long cherished dream of the enthusiastic New Yorker who has been interested in this splendid boulevard or driveway.

The first section of this driveway was authorized by the Board of Estimate in 1898. The work is now completed and consists of a magnificent viaduct extending from One Hundred and Twenty-seventh street to One Hundred and Thirty-fifth street, bridging the Manhattanville Valley and opening up the section of Washington Heights to a participation in the advantages of the Riverside Drive. By this means an uninterrupted drive is now possible from Seventy-second street to the Boulevard at One Hundred and Thirty-fifth street.

RIVERSIDE DRIVE TO BE EXTENDED

It is further proposed to extend this driveway and make a connection between the lower drives and parts of the city with the upper section of Harlem and the Bronx by the way of the Boulevard Lafayette and Audubon Park. It is expected that work will soon be commenced north of One Hundred and Thirty-fifth street. I am exceedingly anxious to have this needed improvement under way, and expect to make application to the Board of Estimate immediately for an appropriation sufficient to carry out the idea. What is now one of the most unsightly portions of the city will thus be converted into a park and driveway equal in beauty to any in the borough. It is proposed to have a roadway sixty feet in width, a bridle path of eighteen feet, beside walks and grass plots bordered with trees and flowers, all of which will be within sight of the beautiful Hudson, and in many places terraced down to it. This will give to the residents of Harlem one of the most charming recreation grounds in the world. All cross streets, with the exception of One Hundred and Thirty-eighth, One Hundred and Forty-fifth and One Hundred and Fifty-first streets will be graded to meet the level of the driveway. The latter will be carried over the three streets mentioned by artistic masonry arches, with access to the streets by flights of steps.

There have been some objection to the proposed viaduct over the

THE SKYLINE OF NEW YORK AS IT APPEARS TO-DAY

New York Central tracks, to avoid Trinity Cemetery, at One Hundred and Fifty-third street, but I have taken steps to enable the drive to be carried over or across the cemetery to avoid this objectionable feature. This method of treatment has its artistic value and can be brought out by means of æsthetic masonry arches which ultimately may be covered with vines and creepers. The drive will then continue to its connection with the Boulevard at One Hundred and Fifty-eighth street.

It has been suggested, however, that a better condition of the Lafayette Boulevard may be secured by bridging One Hundred and Fifty-eighth street and continuing the drive to about One Hundred and Fifty-ninth street. Whatever may ultimately be determined upon, it must be conceded that the extension of Riverside Drive, skirting as it does the river, beautified by both art and nature, is a much needed improvement, and will add greatly to the value and usefulness of the park systems of the city.

RIVERSIDE DRIVE VIADUCT, SHOWING MASONRY OF SOUTH APPROACH AND STEEL WORK

PRICES OF ARC STREET LIGHTING IN MASSACHUSETTS

How to Determine the True Cost of Operation—The Rule Applied to Thirty-One Cities—The Comparative Cost Shown—Wide Variations in Rates Charged

By Alton C. Adams*

PUBLIC service corporations supply arc street lighting in thirty-one cities of Massachusetts. It is the intention here to determine the prices charged for this service in these cities during each year from 1894 to 1901, and to point out such relations as exist between the numbers of lamps operated and the prices charged.

THE TRUE COST OF OPERATIONS

The yearly cost of operation for arc lamps varies directly with the number of hours that they are used for illumination, and with the rate at which each lamp requires electrical energy. In other words, the true measure of service to an electric lamp is the amount of energy sent into it. This amount of energy is conveniently measured and computed in kilowatt hours, which represent simply the product of the kilowatts required to operate the lamp, times the number of hours that the operation continues.

Arc lamps are commonly designated by nominal candle-powers, as 1,200 or 2,000, or in other cases, by the amperes required for operation, as 5, 6 or 10. Though arc lamps do not yield the degrees of illumination indicated by their nominal candle-powers, each candle-power rating substantially corresponds to a certain rate of energy consumption in a given type of lamp. The same is true of ampere ratings. For open arc lamps, which are usually rated in nominal candle-power, the energy required for operation is nearly 0.25 watt per candle-power. Enclosed arc lamps are frequently rated in the amperes required for operation, and the ampere figures should be multiplied by about 80 to determine the watt-consumption. Knowing the watts necessary at any lamp, and the hours of its operation per year, the watt-hours are determined by simple multiplication. Thus, a 1,200 candle-power arc requires 1,200 x 0.25=300 watts to operate, and if burned ten hours per night for 365 nights per year, the energy consumed amounts to 365 x 300=109,500 watt-hours, or 109.5 kilowatt-hours.

RULE APPLIED TO THIRTY-ONE CITIES

In the thirty-one cities here considered, arc street lamps vary in rating from 1,200 to 2,000 candle-power, besides several ampere ratings. The times during which street lamps are operated range from about five to more than ten hours per night, and the number of nights per month from twenty to over thirty.

From these facts it is evident that a satisfactory comparison of prices can only be made by the reduction of all charges to cents per kilowatt hour. Most private consumers are already charged for electrical energy directly on the basis of the kilowatt-hours consumed, as indicated by meters, rather than on the old plan of so much per lamp. This basis of charges per kilowatt-hour has also been adopted in some contracts for street lighting. Reports of the Electric Light Commissioners for Massachusetts show the average number of hours of operation per night, and the average number of nights per month, during which street lamps are operated in each year, for the cities here considered. Prices per lamp per night, month, or year are also given in the same reports. From this data the prices of arc lighting in cents per kilowatt-hour have been calculated.

To facilitate comparisons, the table of cities and prices has been arranged in an order corresponding to the number of lamps used daily, on an average, in each place. Boston easily heads the list with an average daily number of 3,259 arc street lamps, in 1901. Springfield is second, with 774 arcs in daily use on an average. Melrose stands lowest on the list with only 51 arc street lamps, on an average daily. It will be noted at once that the cities with the largest numbers of lamps do not get the lowest rates. Boston purchases its street lighting from three companies, and one of these operated 2,794 arcs for the city daily during 1901. This number of arc street lamps is from three to four times as great as those in the next largest cities, but prices in Worcester, Springfield, Lawrence, Fall River, Lowell, Lynn and Salem were below the 6.6 cents per kilowatt-hour paid by Boston. The lowest prices per kilowatt-hour were 5.4 cents at Salem, 5.4 cents at Lawrence, and 5.6 cents at Lynn.

COMPARATIVE COST OF LIGHT IN MASSACHUSETTS

Prices of street lighting by arc lamps, in cities per kilowatt-hour in each year from 1895 to 1901.

* Boston, Mass. Copyrighted, 1902, by Alton D. Adams.

City.	Average number of arcs 1901	1895 Cents	1896 Cents	1897 Cents	1898 Cents	1899 Cents	1900 Cents	1901 C'ts
Boston	2,794	7.0	6.6	6.5	6.5	6.6	6.6	6.6
Boston	223	7.5	6.6	6.6	6.6	6.6	6.6	6.6
Boston	242	6.6	6.7	6.6	6.6	6.6	6.6	6.6
Springfield	774	6.4	6.2	6.4	6.4	6.3	6.3	6.4
Fall River	686	8.8	7.9	7.8	6.6	6.5	6.5	6.5
Worcester	679	7.0	6.6	6.2	6.2	6.0	6.1	6.1
Cambridge	541	9.8	8.5	8.5	8.9	8.5	7.8	8.5
Lowell	492	—	6.6	6.6	6.5	6.1	6.0	6.1
Somerville	402	10.4	10.4	10.4	9.5	9.5	9.0	9.4
Lynn	286	7.6	7.4	7.5	6.2	6.0	6.0	5.6
Lawrence	286	7.8	7.8	7.6	7.2	7.4	6.8	5.4
Fitchburg	277	11.5	11.4	11.4	10.4	10.4	9.7	10.8
Salem	272	8.0	7.5	7.3	7.2	7.2	6.3	5.4
Holyoke	259	11.1	8.4	8.4	8.4	8.4	8.4	8.4
Brockton	256	—	—	7.8	7.5	7.7	7.9	7.3
Chelsea	225	10.0	8.9	9.2	9.0	8.3	8.0	8.3
New Bedford	211	8.0	8.1	7.0	7.2	7.5	7.0	7.3
Haverhill	195	8.0	—	6.6	10.7	7.2	6.7	6.7
Newton	190	11.7	9.0	9.0	10.2	14.8	8.2	8.1
Beverly	175	—	—	15.0	15.0	15.0	10.2	10.0
Northampton	164	—	—	14.1	14.4	14.3	15.7	13.4
North Adams	162	—	9.6	8.4	8.1	8.3	8.0	8.4
Newburyport	155	14.8	14.9	14.3	15.8	15.6	15.3	13.9
Waltham	147	11.5	11.5	11.5	11.5	11.5	11.5	11.4
Quincy	106	15.3	15.7	15.6	15.7	15.7	14.5	13.7
Malden	102	—	—	10.9	12.6	13.0	13.1	9.7
Pittsfield	85	—	10.5	10.5	10.5	10.5	10.2	11.6
Medford	94	14.6	16.8	17.7	15.5	11.4	10.9	10.0
Woburn	74	17.9	17.4	17.4	17.0	9.7	13.9	10.3
Everett	67	15.6	17.4	10.0	11.7	12.7	12.2	14.0
Gloucester	59	12.6	16.0	20.6	15.8	16.4	12.8	12.4
Marlboro	53	12.4	12.6	12.6	12.6	11.7	10.2	12.3
Melrose	51	18.6	20.6	18.0	17.5	15.5	15.4	13.2

At Salem the daily average for arc street lamps was 272, at Lawrence the number was 286, and at Lynn the average was also 286. In 1895 the lowest price for arc street service was that of 6.4 cents per kilowatt-hour at Springfield. The highest rate for arc street lighting in 1895 was 17.9 cents per kilowatt hour at Woburn. During 1901 the highest rate for similar service was 14 cents per kilowatt-hour, paid by Everett. In the entire period between the two years just named, the highest price for service to arc street lamps was 20.6 cents per kilowatt-hour, the rate charged at Gloucester, in 1897.

WIDE VARIATIONS IN RATES CHARGED

Even among cities using about equal numbers of arc lamps, there are wide variations in the rates charged per unit of service. Thus, Woburn with a daily average of 74 lamps paid 10.3 cents per kilowatt-hour in 1901, while Everett, in the same year, with 67 lamps, paid 14 cents per kilowatt-hour.

North Adams had illumination on its streets from 162 arc lamps daily, on an average, in 1901, and paid at the rate of 8.4 cents per kilowatt-hour for the service, while Newburyport, with an average of 155 arcs daily, was charged 13.9 cents per kilowatt-hour. In the year just named the price for street arcs at Fitchburg was 10.8 cents per kilowatt-hour and the average number was 277, but in Lawrence, where 286 arcs were used, only 5.4 cents per kilowatt-hour was charged. Somerville paid 10.4 cents per kilowatt-hour for service to 402 arc street lamps, and Lynn was supplied with light from 286 arcs at the rate of 5.6 cents per kilowatt-hour.

Cambridge, with a daily average of 541 arc street lamps, was charged at the rate of 8.5 cents per kilowatt-hour, in 1901, while Lowell, with 492 street arcs paid only 6.1 cents per kilowatt-hour. Boston, Springfield, Fall River, Worcester, Lowell and Haverhill each paid from 6.1 cents to 6.7 cents per kilowatt-hour for service to arc street lamps in 1901. During the same year three cities paid from 5.4 to 5.6 cents per kilowatt-hour for arc service. Two cities paid at the rate of 7.3 cents per kilowatt-hour for arc street lighting. From 8.1 to 8.5 cents per kilowatt-hour was paid in five cities for arc street lighting during the year last mentioned.

Two cities in that year paid 9.4 and 9.7 cents respectively for service to street arcs. Four cities were charged from 10 cents to 10.8 cents per kilowatt-hour in the same period. Rates in two other cities were 11.4 and 11.6 cents respectively for similar service. Two more cities paid 12.3 and 12.4 cents respectively per kilowatt-hour for arc street lighting. In four cities prices ranged from 13.2 to 13.9 cents per kilowatt-hour. The highest rate of 14 cents per kilowatt-hour for service to street arcs, in 1901, was paid by only one city. Taking a general view of these prices for the last year, it appears that the highest are nearly three times the lowest rates, and that the lowest as well as the highest rates are found in the smaller cities, or those that use not more than 286 arc street lamps daily on an average. In spite of this fact the general range of prices is lower in the large than in the small cities, though there are some notable exceptions, as where Lynn secures the service of 286 street arcs at a less rate than that paid for 2,794 arcs in Boston.

Looking at the range of prices through the entire series of years, the cities may be roughly divided into two groups. In one group of which Boston, Worcester and Marlboro may be taken as examples, prices for arc street lighting have remained nearly constant since 1895. The other group of cities includes those where the price of service to arc street lamps has materially declined during the period under consideration and may be represented by Fall River, Lynn and Woburn. Seventeen cities show a decline of not less than one cent per kilowatt-hour between the prices of 1895 and those of 1901. In fourteen cities the price has been lowered less than one cent per kilowatt-hour, between the earlier and the later year. The largest reduction in any one city was 7.6 cents per kilowatt-hour.

UNIFORM SELF GOVERNMENT FOR CONNECTICUT CITIES

At a meeting of the Mayors' Association of Connecticut, held at Hartford on the 30th of January, the following resolution was unanimously adopted and presented to the Constitutional Convention at Hartford, and the convention was asked to embody in its work the substance of the resolution for uniformity of local self-government.

"Whereas, the people of the towns, boroughs and cities of the State of Connecticut are, in the opinion of this, the Mayor's Association of Connecticut, capable of determining by popular vote whether or not they desire their respective municipalities to engage in supplying to the public, water, gas and electricity, and

"Whereas, in our opinion, every such municipality can safely be trusted to wisely determine such question upon popular vote, and

"Whereas, common justice requires that the right so to do shall be preserved to each and every town, city and borough in this State, and

"Whereas, we have observed that these rights have been impaired and by means of both general and special legislation are being frittered away, and

"Whereas, it is essential to the material progress of the State of Connecticut, and necessary to the cause of good and economical local government, that these rights shall be rigidly preserved, and

"Whereas, we believe that this can be done without interfering with any just claims in behalf of private corporations already established; now, therefore, be it

"*Resolved*, That the Constitutional Convention now in session at Hartford be requested to take this matter under consideration and to insert in the Constitution, about to be adopted, an appropriate provision covering the points in question and conserving to the various towns, boroughs and cities of the State, this inherent attribute of the priceless right of local self-government.

"And resolved further, that this association especially indorse and recommend for insertion in the Constitution a provision reading as follows, viz:

"The General Assembly shall not enact any law, public or private, which shall infringe, abridge, limit or impair the right of a town, city or borough to engage in supplying water, gas or electricity for public, private or commercial purposes, within the limits of such town, city or borough, except, however, that the General Assembly may require a town, city or borough, before engaging in so supplying water, gas or electricity to pass at a regular election one affirmative majority vote favoring such purpose and also to purchase the plant, apparatus and appliances of any existing company already engaged in supplying water, gas or electricity within the limits of such town, city or borough, for a price which shall not exceed the cost of duplicating such plant, its apparatus and appliances and the fair market value of any real estate owned by such company and used in connection with such plant."

THE REFUSE DISPOSAL PROBLEM

English Practice Better Than the American—Evolution of the English System—Incineration the Only Good Process—Power Secured from Burning Refuse—Comparative Tests

By W. F. Goodrich

W. F. Goodrich

WITHIN the limits of such an article as this, it is impossible to deal with the subject of refuse destructors at any serious length. It would have been interesting to compare our British practice in refuse destruction with that in vogue in America, but this I cannot very well do because the modern British destructor is essentially a power destructor, while on your side you have yet to learn that refuse (like knowledge) is power.

You have tried various reduction systems, and the principle of reduction has still a strong following; on the other hand we do not believe in it, and it is never likely to get a chance in this country.

Practical men here term reduction, "Tinkering with the business," and there can be no question at all that it is a mistaken policy to have separate collections or sorting of the waste with consequently various methods of ultimate disposition.

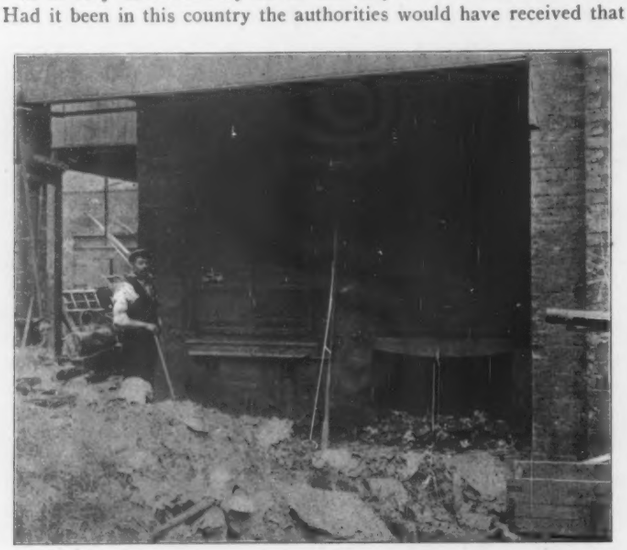
Refuse should be dealt with unscreened and, as a general rule, sufficient calorific matter will be found in refuse not only to thoroughly cremate all that is harmful and offensive, but also to produce a considerable amount of steam.

STAGGERED BY AMERICAN METHODS

Sanitarians in this country view with amazement your efforts toward sanitary refuse disposal in America. We are simply staggered by your methods; we gather, for instance, from the columns of the *Brooklyn Eagle*, for June 27, 1901, that specifications were issued and tenders invited on June 17 for the final disposition of the garbage and kindred refuse of Manhattan and Bronx Boroughs. The tenders were to be handed in before June 27, *less than ten days* being allowed to secure a suitable site, prepare plans and specifications for a plant capable of dealing with no less than 1,000 tons of garbage per twenty-four hours, less than ten days for a task of this magnitude! What does it all mean? But even this is not all. "The contractor or bidder shall build this plant within the territorial limits of the City of New York," and the party securing the contract is allowed thirty-three days in which to erect a plant of this enormous capacity and have it ready for work!

It is very extraordinary to us that any bid was received at all. Had it been in this country the authorities would have received that snub they so richly merited by being ignored altogether, but, strange to say, some bids were received other than those by the Sanitary Utilization Co., which already had a plant on Barren Island, and so, obviously, could tender lower than any other contractor, and it is safe to say that they alone could be ready to commence dealing with the garbage by the time stipulated.

This to our mind has a very suggestive appearance. Without any cant, it is not our way. When a municipal authority in this country decides to dispose of its refuse in the only sanitary and final manner, *i. e.*, by fire, the transaction is, it may be safely said, a sound commercial deal. On his part, the contractor is bound down to certain guaranteed results, while on its part the municipality takes its quota of risk and pays the contractor his price, usually 80 per cent. during the course of erection, 10 per cent. at completion and the balance is withheld until the city is satisfied as to the performance of the guarantees, and decides to take over the plant from the contractor.



A.—THE FIRST BRITISH DESTRUCTOR

B.—MELDRUM DESTRUCTOR, ALDERSHOT

This is a square deal, and it may be safely said that, as a general rule, the municipality gets value for money; if it does not, it is its own fault.

Proceeding upon these lines, in this country about 150 municipalities now have destructors either at work or under construction. Every destructor is not an unadulterated success. In some instances the performance has fallen short of the guarantee, but the council has the remedy in its own hands. However, generally speaking, our destructors are doing well and we may safely claim to lead the world.

MUST ADOPT ENGLISH SYSTEM

Before describing a few recent British installations, I would venture to remark that if you are anxious to emulate us you must make up your minds to go into the business generally upon our lines. It may hurt your pride to follow this poor degenerate country which, we are told, you are gradually absorbing, and it may appear to you the height of impudence for me to suggest that you can learn anything from our system of municipal administration, but be that as it may, the end will often justify the means. Municipal affairs in this country do not partake of a speculative nature. Sporting bids for dealing with refuse will never be tolerated here. We move on sound practical lines. Public money is being spent and, as a general rule, it is invested well.

In introducing a few examples of modern British power destructors, I may say that we are showing you something now which you cannot claim to approach, parallel, or beat. *We* lead this time and with a fairly comprehensive knowledge of what you are doing, I venture to say that we are likely to lead for a very long time yet.

You must set your municipal house in order. To begin with, your sanitarians must recognize that refuse disposal is a problem, and that a solution can only be arrived at by scientific application. Up to the present, it is certainly conceded by your own engineering press, that the field of inventors for the most part has been occupied by cranks, one idea men, and others of very limited knowledge. Excuse my candor, but you have the result evident enough to-day—scarcely one destructor working in your country which is equal to our productions of twelve years ago even, and during the past twelve years our progress has been phenomenal. Indeed during that period we have brought the destructor from a crude condition to an almost perfect production.

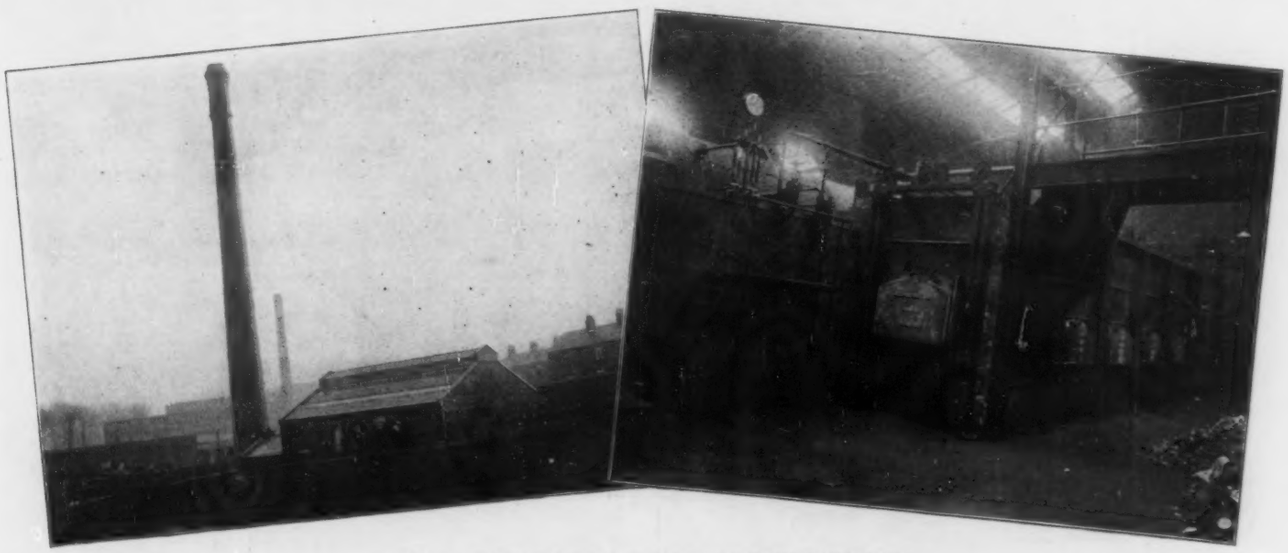
Manchester was the birthplace of the British destructor, and as some evidence of the enduring nature of British workmanship I am here able to reproduce a photograph of the first two "Fryer" cells ever constructed (see A, p. 188). The late Mr. Alfred Fryer, who was for a long time connected with the eminent Nottingham firm, Messrs. Manlove, Alliot & Fryer, erected these cells in the year 1876, and they are working to-day. It will be noticed that Meldrum's Forced Draught is now added to one cell. This addition was made about a year ago, enabling 50 per cent. more refuse to be destroyed than was possible formerly. Messrs. Meldrum Brothers, Ltd., "Fume Cremator," that secondary furnace fed with coal or coke to which your makers tenaciously cling to this day. It did not last long with us. It made the cost of destruction prohibitive. It is at the best a makeshift and not a solution. It had to go and give place to the real solution; high temperature in the furnace and flues. The secondary furnace is now looked upon in this country as a sign of weakness, and a modern destructor with this adjunct receives very scant consideration, where it is not carefully avoided.

EVOLUTION OF THE ENGLISH DESTRUCTOR

The essential feature then of our modern destructor is the production and maintenance of a high temperature. This varies from 1,800° F. to as high as 2,700° F.; further, the resultant high temperature gases travel through and around high pressure steam boilers, passing also through economizers for heating the feed water, and through regenerators for heating the air for combustion.

The figures of some of the evaporative tests here produced will serve to show what very extraordinary results we are obtaining in power production from the combustion of ordinary domestic waste unscreened. B. shows a small destructor erected by Messrs. Meldrum Bros., Ltd., at Aldershot. Here, with about nine tons of very poor refuse per day, the whole of the sewage is pumped, varying in volume from 750,000 to 2,000,000 gallons daily. One cell only is worked at a time and one Cornish boiler. The cell has a grate area of only 22½ square feet.

As concrete evidence that the destructor is a splendid investment



C. AND D.—PLANT RECENTLY ERECTED AT NELSON, LANCASHIRE

have just received instructions from the Manchester Corporation to similarly equip eleven more of their old fashioned low temperature cells, "converting" them to high temperature and greatly increasing their destroying capacity and efficiency even in their old age.

Although we are not generally considered to be progressive, especially by Americans, yet we are either pulling down old low temperature destructors and building modern high temperature furnaces in their place or "converting" existing cells in such a manner as to prevent nuisance, increase efficiency, and meet modern requirements. This is the general trend throughout the country. A few years hence the original type of cell will be a rarity, and yet you allege that we are slow, although you have, so far, hardly reached where we commenced.

Space forbids any lengthy review of the evolution of our refuse destructor here. We commenced with the low temperature destructor. It was a poor production, but despise not small beginnings. Weak as it was, it was the pioneer, and it is primarily responsible for our present satisfactory condition. Nuisance with the original type of cell was combated by the introduction of the

here, apart altogether from the sanitary aspect, I may say that the work now being done by refuse alone formerly cost £300 per year for coal. This is not all; the residue every day—about 50 hundredweights of fine vitrious clinker—is used upon the bacteria beds, being one of the best known mediums for this purpose. This also saves another £200 per year formerly spent on coke for filtration purposes. Now let us look at the other side; the cost per ton for destroying the refuse (i. e.) labor cost, is 1/ per ton, or a daily wages bill of 9/ against 4/6 per day previously spent for burning coal in the same boilers now fired with the destructor gases alone.

Precisely similar work is being done at Hereford, Shipley and other places. There is no municipal juggling or frantic manœuvring to make matters appear different to what they really are; and the bare fact remains that whereas, before refuse was burned, coal was used and cost so much per year, with the advent of the destructor coal is not employed.

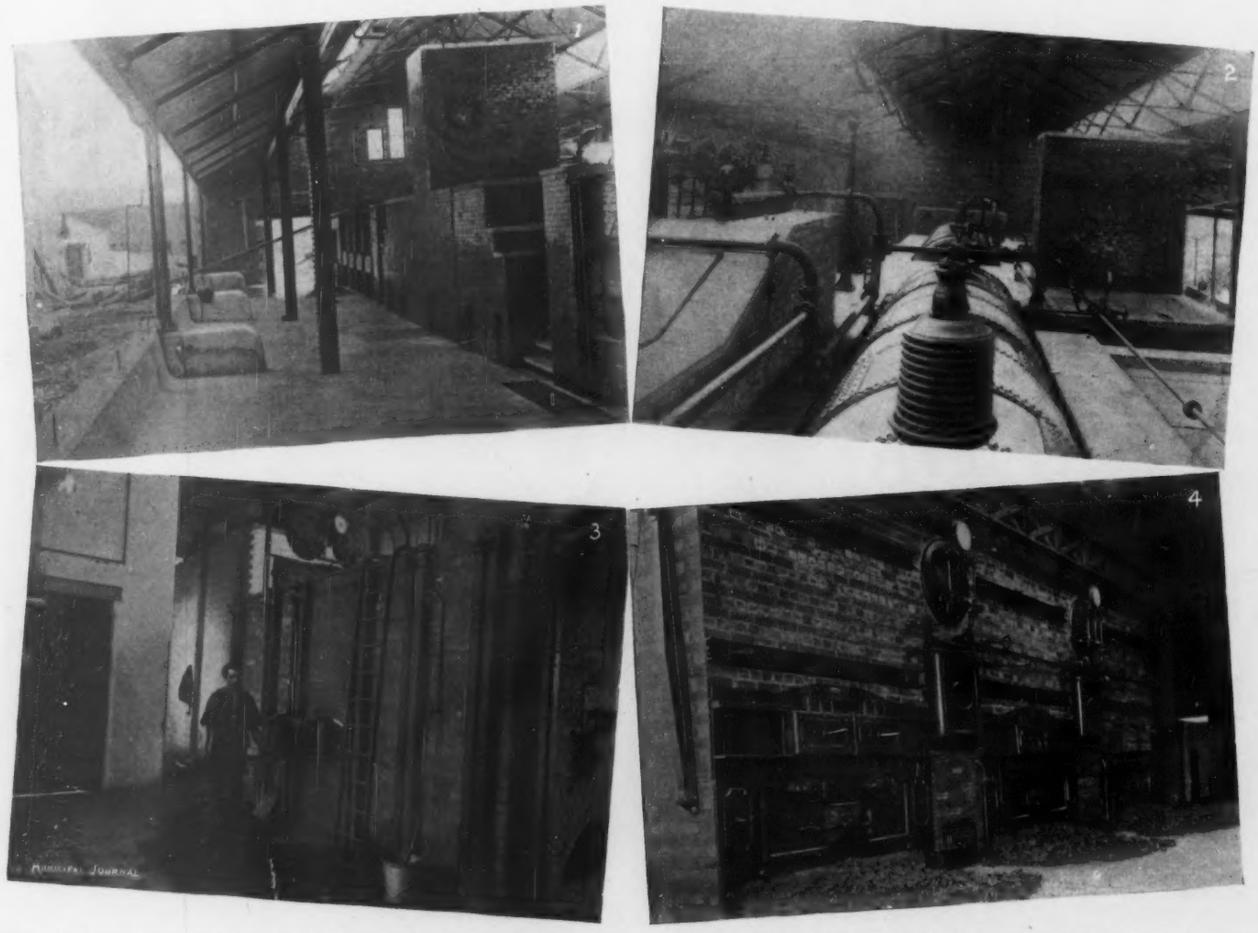
I am desirous that the reader should not form an opinion that I am attempting to justify the destructor because it is at length a power producer; this is not so. I contend, my civilized readers,

that even if no power was produced at all, that if burning was the most expensive means of disposal, even then your only correct course is to follow the poor despised heathen and destroy your filth by the agency of fire.

But, as it is now quite beyond all dispute that considerable power can be obtained from refuse, there is an additional reason for its destruction, and it is this demonstration which is helping sanitary refuse disposal along in this country, because this aspect, we may call it, the commercial aspect, appeals to many a man who has a keen business instinct but a very hazy notion of sanitary science.

C and D, page 189, illustrate a plant recently erected at Nelson, Lancashire. It is particularly interesting, being the first specially designed for dealing with a quantity of that very objectionable waste,

Weight burned per day of twenty-four hours	31 tons.
Weight burned per square foot of grate per hour	29 pounds.
Water evaporated per hour from and at 212° F. average	538 gallons.
Water evaporated per pound of refuse from and at 212° F.	1.85 pounds.
Water evaporated per square foot of heating surface per hour from and at 212° F	5¾ pounds.
Average temperature of combustion chamber (51 readings)	1,959° F.
Average temperature of downtake	1,070° F.
Average temperature of side flues (leaving boiler)	654° F.
Average temperature in main flue (after regenerator)	410° F.
Average temperature of heated air	243° F.
Average air pressure in ashpits	1½ in. of water.
Average steam pressure (Crosby recording gauge)	120 pounds.
Average temperature of feed water	59.8° F.
Percentage of clinker	30.2
Percentage of fine ashes from ashpits	3.4



E. 1 AND 2 SHOW LANCASTER PLANT RECENTLY COMPLETED WITH POWER USED FOR ELECTRIC TRACTION; E. 3 SHOWS PAIR OF BEAMAN & DEAS CELLS ERECTED AT COLNE, LANCASHIRE; E. 4 REPRESENTS WARNER "PERFECTUS" TYPE OF DESTRUCTOR, NOW BUILDING AT WEST HARTLEPOOL

offal. At the near end of the cell a hopper will be noticed, the top of which is level with an overhead gangway. The barrels containing the offal are brought along this gangway and the contents are tipped direct into the cell. The gaseous products, having a sideway motion, must pass over the whole body of active fire before reaching the combustion chamber. It is thus possible to destroy a considerable quantity of this vile material without a semblance of nuisance.

OBSERVATIONS MADE DURING FOUR WEEKS' WORKING OF MELDRUM'S PATENT REGENERATIVE REFUSE DESTRUCTOR AT NELSON, FROM 10:15 A. M., FEBRUARY 19TH, TO 10:30 A. M., MARCH 16TH, 1901.

Number of cells, 4; grate area, 100 square feet; Lancashire boiler, 30 feet by eight feet; heating surface, 986 square feet.

Refuse consumed:	Tons.	Cwts.
Ordinary ashpit refuse	571	12¼
Light refuse	29	11¼
Vegetable refuse	9	¾
Fish and offal	16	18
	627	2¼
Less pots, tins, etc., not burned	13	3¼
Total weight of refuse consumed	613	19½

Percentage of flue dust, the majority of which settled in the combustion chamber	5.05
Total residual incombustible	38.65 per cent.

NOTE.—The above observations were made while the plant was working under ordinary normal conditions, including banked fires at week ends.

TEST OF MELDRUM'S PATENT REGENERATIVE REFUSE DESTRUCTOR AT NELSON, APRIL 25TH, 1901.

Duration of test, eight hours.

	Tons.	Cwts.	Qrs.
Refuse delivered	25	2	1
Less pots and tins		12	3
Total refuse burnt	24	9	2

Refuse burnt per hour, three tons one hundredweight	6,853 pounds.
Refuse burnt per square foot grate per hour	68.5 pounds.
Total water evaporated, actual	91,600 pounds.
Water evaporated per hour average, actual	1,145 gallons.
Water evaporated per hour from and at 212° F. (average).	1,337 gallons.
Water evaporated per hour average from and at 212° F. per square foot of heating surface	13.5 pounds.
Water evaporated per pound of refuse, actual	1.67 pounds.
Water evaporated per pound of refuse, from and at 212° F.	1.95 pounds.

Average steam pressure	122 pounds.
Average feed water temperature	83° F.
Percentage of clinker	29
Percentage of fine ashes from ashpits	1.8
Average temperature of combustion chamber	2,227°
Average temperature in down take	1,306° F.
Average temperature in side flues, leaving boiler	922° F.
Average temperature in main flue after regenerator	666° F.
Average drop in temperature due to regenerator	256° F.
Average temperature of heated air from regenerator	394° F.
Average temperature of air entering regenerator	82° F.
Average percentage of CO_2 (Orsat apparatus)	14.4
Highest percentage of CO_2 (Orsat apparatus)	19.8
Lowest percentage of CO_2 (Orsat apparatus)	4.8

The figures of two comparative tests with this plant are here given and they are most instructive, on the one hand you have a continuous test lasting one month and another test lasting only eight hours. A continuous test over such an extended period as one month is an entirely new departure and the data gathered is of the utmost value; Mr. J. A. Priestley, Nelson's Health Superintendent, has done a good service to sanitary science thereby.

In comparing the figures of the two tests, the engineer must at once be impressed by the remarkable elasticity of the plant, and herein lies the real value of the best type of modern power destructors, being so readily adjustable over wide limits it has a wider sphere of usefulness.

E. 1 and 2, (p. 190), illustrate a very fine plant completed for the corporation of Lancaster, where the power will be used for electric traction. The illustration, E. 2, should be of special interest to American sanitarians as showing that very necessary part of our British power destructor—the steam boilers, around and through which the high temperature gases circulate. These boilers are, as will be seen, of the Lancashire type, each thirty feet long by eight feet in diameter, of the very finest construction, and designed for a working pressure of 200 pounds to the square inch.

F.—HORSFALL'S DESTRUCTOR SHOWING CLINKERING PROCESS

In addition to the regenerators for heating the aid for the forced draught supplied to the cells, a Green's economizer is included, so that the gases will generate steam, heat air for combustion, and heat the feed water, and it may be assumed that from a combustion chamber temperature of about 2,000° F. the gases will be reduced at the chimney base to about 400° F. This is a design and combination illustrative of our very best modern British practice.

The installations already mentioned are of Meldrum's simplex type, the cells being fed entirely by hand. This system of feeding is objected to by many, although the results obtained are considerably in advance of anything being done by the systems of top or back feed. Close investigation very often removes objection, and it is so with the system of hand feeding. It is no more laborious than the best of overhead feeds, and the proof may be found in comparison of cost per ton destroyed between this and various other systems.

It is not my purpose here, however, to make invidious comparisons or to confine myself to one particular type of destructor, so we will proceed to deal with one of the best known overhead charged types, viz: the Beaman & Deas destructor. E. 3 shows a pair of Beaman & Deas cells erected at Colne, Lancashire, Babcock & Wilcox boilers being employed to absorb the high temperature gases. In the case of this installation, the refuse is tipped direct into an overhead storage hopper, from which the material gravitates toward the charging hole, sufficient for one charge being taken as wanted. This first falls on to the drying hearth at the back of the grate in the cell, and from there it is raked forward, as wanted. Two cells are placed side by side, and are charged and clinkered alternately, so that when the one cell is being clinkered the other is in full work and at its greatest heat. Both cells discharge their gaseous products into one common combustion chamber, where there is a thorough commingling of the gases before they reach the boiler.

The combustion chamber temperature is very uniform, and is readily maintained at or near 2,000° F., so that nuisance is impossible. The results in power production are exceedingly good, as will be seen from the figures here given of a test with cells of this type at St. Helens, Lancashire, where the power is used for electric traction purposes.

TEST OF BEAMAN & DEAS DESTRUCTOR—ST. HELENS INSTALLATION

Date of test, April 10, 1900; duration of test, 10:30 a. m. to 5:50 p. m., seven hours twenty minutes; state of weather, fine, windy; kind of fuel burned, unscreened ashpit refuse.

Total weight of fuel burned	37,912 pounds.
Weight burned per hour	5,169 pounds.
Weight burned per square foot of grate area per hour (50 square feet)	103 pounds.
Total weight of clinker and ash	11,900 pounds.
Percentage of clinker and ash	31.36 per cent.
Total water evaporated	48,216 pounds.
Water evaporated per pound of refuse (actual)	1.27 pounds.
Water evaporated per pound of refuse from and at 212° F., including economizer	1.54 pounds.
Temperature of water in tanks	46° F.
Temperature of feed water from economizer	190° F.
Average steam pressure	132 pounds.
Average air pressure under grates	3.1 inches.
Temperature in combustion chamber by copper test	2,000° F.
Temperature in main flue, before economizer	537° F.
Temperature in main flue, after economizer	358° F.
Percentage of CO_2, average for twenty-one readings	10.4 per cent.
Percentage of O, average for twenty readings	9.16 per cent.

I would direct special attention to the very high rate of combustion with this plant. So far as I know, the refuse destroying capacity of a Beaman & Deas standard cell with twenty-five square feet of grate area is considerably higher than with any destructor cell yet produced. While I am aware that there is something to be said against this from the point of view of labor cost, yet a cell that will destroy refuse at over 50 per cent. above its rated capacity is a great boon.

F. (see page 191) is typical of another well known make of destructor—the Horsfall—which is, as is generally known, charged overhead. The particular cells here illustrated are those in use at Hammerston Street, Bradford. With this type of destructor a drying hearth or secondary grate is used as with the Beaman & Deas cell, but, generally speaking, although the grate surface is larger, the destroying capacity of the cell is considerably less than with the type last dealt with. One Horsfall cell, as a rule, deals with from seven to ten tons per twenty-four hours, while the Beaman & Deas normal rate of consumption is fifteen tons per cell per twenty-four hours, and in most installations over twenty tons is passed through each cell.

Another type of destructor, here illustrated, E, 4, is the Warner "Perfectus," now in course of erection at West Hartlepool. This destructor has been on the market for a number of years. It can, however, be scarcely placed in the same category as those already dealt with; firstly, because the temperatures reached are not nearly so high, and, secondly, because it is far less prominent as a power producer; thirdly, because a fume cremator or secondary furnace is even now occasionally employed. The connection between these three reasons will at once be obvious.

A., (page 188), shows the original "Fryer" cell. It is needless to

add that in twenty-five years this has been vastly improved and some excellent examples are now working in various parts of this country. Probably the "Fryer" cell is better known in America than any other British make, and it is therefore unnecessary to describe the same here, suffice to say, that it is the only mechanically charged cell in this country. It is claimed that this mechanical handling of refuse greatly reduced the labor cost for destruction, but without entering into any criticism concerning this, I must observe that, (1) the initial cost is heavy, (2) refuse is such an unknown quantity—so extraordinary in composition—that it is exceedingly difficult to ensure the best handling of the same by mechanism, (3) mechanical means do not dispense with the human element to any serious extent, and the cost per ton destroyed with ordinary top back and front feed destructors are no higher than where mechanical charging is in use, (4) there must always be an element of uncertainty about mechanism, and this is particularly the case in a dust charged air. It is for these reasons that I am doubtful as to the real value of mechanical charging.

G.—SHOWING WHERE REFUSE DESTRUCTORS HAVE BEEN INSTALLED

The destructors I have dealt with are those most extensively employed in this country. All five may be said to be well known and altogether beyond the experimental stage. We have two or three other types, but it is too early yet to form any conclusive idea as to their merits, they are still purely experimentary.

G. will be interesting as showing at a glance twenty-five years' progress in the adoption of refuse destructors in England and Wales. This photo chart may be said to indicate our position to-day. I do not claim that it is remarkable, on the other hand, it suffices to show what I contended in my opening sentences—that gross ignorance still abounds. That cannot be disputed when one remembers the enormous number of populous centers and even health resorts in this country still without any sanitary means of refuse disposal.

If we are weighed in the sanitary balance and found wanting what shall be said of America? If our poor decaying country, with its unique power destructors, is admittedly behind, how do you stand? It is not necessary for me to supply the answer, for it must be obvious to every thinking man. If you were asked, What can you now do with electricity? we should hear of extraordinary developments, but if you are asked, What do you do with the by-products of existence? your domestic refuse? your filth? What becomes of it? There is no satisfactory answer!

SUCCESSFUL CO-OPERATIVE TELEPHONE EXCHANGES

THE result of the extortionate prices exacted by the telephone companies in Wisconsin has been the formation of co-operative companies, and from an experiment these have developed into permanent benefits to the community at large. Many of the stock companies developed into private corporations because a few of the stockholders got all the stock into their hands. It was to provide against this that the present co-operative telephone companies have been formed

The primary object of these companies is good service to the community, and what profit does accrue is expended in improvements and extensions of the lines. At Grand Rapids, Wis., one of these companies was started and the success of this one led to other towns and cities in the Wisconsin Valley taking up the problem. The company was organized with a capital of $5,000, divided into 100 shares, each representing the cost of the installation of a single instrument. Each stockholder was allowed only one share for every instrument rented by him and the ownership of the stock was absolutely confined to renters of telephones. Dividends of 1 per cent. were to be paid on the stock monthly. Experience proved that at $2.25 for stores and $1 for residences per month the company could give good service and increase its dividends to 1½ per cent per month so that in time the patrons had to pay monthly only $1.50 for business service, after deducting the dividend, and only 25 cents for residences For each instrument the operating expenses were $9 a year. Allowing $3.50 a year for interest and depreciation of plant an income of 25 per cent, was required.

Starting with eighty-three telephones, the business grew to 300 instruments, being one to every seventeen inhabitants. As it grew, too, the service increased in value to the others in that more persons could be reached on 'phones. No private company could compete with this service and these prices and the co-operative company could not be bought up as stock could only be held by owners of telephones. As soon as a stockholder ceased to rent a 'phone his share was canceled. The old telephone company tried every means of ousting this new company. It offered the rent of 'phones free for three years, hoping by this means to win back enough of the new company's subscribers to compel the rest to go back to the old company because of business necessity. The new company showed the people that if they went back to the old company they would be in their power after three years, while now they had both rates and service in their own hands. Local patriotism carried the day and the old company went out of business.

With this system the larger the subscription list the better the service and the lower the price of rental. Each line is an individual metallic service. Wausau, Merrill and Marshfield and other cities in Wisconsin adopted the plan of the Grand Rapids company. A group of these Wisconsin Valley towns are now served by co-operative telephones and long distance lines will be installed in the near future.

The example set by these Wisconsin towns should, and no doubt will, be followed by towns and cities elsewhere.

MUNICIPAL OWNERSHIP IN THREE EUROPEAN CITIES

Berlin Sells Gas at Forty Cents Per 1,000 Cubic Feet—Gas Plant Made More Than $2,000,000 Last Year—Fitness, Not Pull, Determines Choice of Bureau Chiefs—Employees Appointed for Life or During Good Behavior

By Colonel E. A. Denicke*

It certainly will be conceded that there is nothing socialistic in and about the governments of Berlin, Vienna and Dresden. I was impressed with the strong spirit of anti-socialism which rules there. For example, all mayors, after their election by the voters, must receive their confirmation by the ruling monarch. In Berlin, for instance, Mayor Kauffmann failed to receive confirmation some weeks ago. The reasons were that he was a Liberal in politics, and that about twenty years ago, when he was a lieutenant of the Reserve, he is reported to have made a speech or talked against the government. This was remembered and was reported to the Emperor, and is supposed to have been the cause of his failure to receive confirmation from him as King of Prussia. As a matter of fact, in 1840, when Berlin built its first gas works socialism in its present form was as yet unborn.

MERIT SYSTEM OF APPOINTMENTS

The chiefs of the bureaus are neither appointed to office for any political service as a reward, nor are they elected by the voters on account of their popularity. They are selected and appointed by the head of the city's government. The latter is responsible to the State and to the people. Appointments are for life or during good behavior. All of the bureau chiefs whom I had the honor to meet are men of academic or scientific education except in a few cases, where the chiefs of the paving and sewerage departments were practical mechanics, who had previously gained reputation and honor. This evidence of honor usually finds expression in the title of "Rath," which is conferred by the monarch. Many of the heads of departments have been awarded the degree of Ph. D. or M. D.

It goes without saying that the law in these countries as to the punishment of pilferers from the public treasury is as sure as it is swift. Punishment follows convictions on the spot. No twisting of the law, no quibbling of lawyers, can keep the culprit out of the State's prison. So sure is this that when a defalcation does occur and the defaulter is detected, the culprit frequently commits suicide rather than submit to the stringent criminal proceedings.

BERLIN'S MUNICIPAL GAS WORKS

In 1825 an English company, the Imperial Gas Association, made a contract with the State of Prussia to supply Berlin with gas. In 1840 the city built its first gas works in spite of strong opposition. The arguments put forward then are much the same as used now with us, viz.: that the city was too unwieldy a body to go into the manufacturing business, that the making of gas was not understood by any one of the city's officers, that it would require an army of employees, that the city could not compete with a private concern in business, etc., etc. However, the gas works were built, although the English company at once made a 5 per cent. reduction in price. In 1875 the city became the owner of its streets, and the English company had to cease supplying gas to the old or inner city, but it at once extended or built its works in twenty out of the twenty-five suburbs of Berlin —so that the city, to the great chagrin of the present gas department, supplies only five of the suburbs. Nearly all of the English company's contracts have thirty years to run, except in the city of Schoneberg, one of Berlin's outlying districts, where it owns perpetual rights. The cities of Charlottenburg and Rixdorf, also adjacent to Berlin, own their own gas works and are doing a profitable business.

FORTY-CENT GAS YIELDS HANDSOME INCOME

It is the settled policy of the municipality to put the price of gas down as low as possible, on the principle of the larger the consumption the larger the profit per given quantity. Until now the price was 16 pfennigs (4 c.) for illuminating, and 10 pfennigs (2½ c.) for heating gas, but from now on there will be a uniform rate of 12.35 pfennigs (3 c.) per cubic meter. That rate is in our money about 40 cents per 1,000. This uniformity of price was settled on because it seemed unbusiness-like to charge two different prices for the same article, and because two prices necessitated additional outlay in meters, materials and labor.

At the above prices the city made a profit last year of M. 7,000,000, or $1,680,000. Were the value of the gas furnished free to the city added, the profits would amount to M. 8,800,000, or $2,112,000. The book value of the four works now owned by the city is put down at M. 40,000,000, or $9,600,000. Preparations to erect a new gas works are now under way. I was shown the complete plans of all the buildings and machinery, comprising a volume of more than one hundred drawings, all finished under the supervision of Baurath Gadamer. The cost of the new works is estimated at M. 60,000,000, or $14,400,000, part of which will be covered by the sale of the real estate of the older works, which will be put out of use.

FREE METERS, GAS STOVES AND FIXTURES

The city furnishes free to consumers meters, gas stoves and gas fixtures with Welsbach mantles. The city gets its outlay for these returned by charging a small addition for gas until the amount of outlay is paid off. The city will also in the near future furnish nickel-in-the-slot-machines similar to those now in use in London, so that any one having the machine can get 10 pfennigs (2½ c.) worth of gas by simply throwing in a coin of that denomination. Any unused part of the paid for quantity goes over to the next time that the machine is used.

In order to compete successfully with electric light companies, the city furnishes for street lamps the Lucas burner. In its own gas works and in at least one large store, I saw the Buhlmann lamps. This, as well as the Lucas burner, while throwing off a light nearly as brilliant as electricity, are said to effect a material saving in gas bills. By-products of tar, coke and ammonia are all put into proper shape at the city works. Coke is broken into egg size by crushers, so that it can be conveniently used in small cook stoves.

BERLIN'S WATER WORKS

Director Beer is in charge. From 1852 to 1874 the water supply was in the hands of private corporations. In 1874 the city acquired the system by purchase. The supply is drawn from the Tegler and Muggel lakes, distant from ten to sixteen kilometers (about six to ten miles), supplying daily 90,000 and 170,000 cubic meters respectively (about 23,000,000 and 45,000,000 gallons).

Consumers pay 15 pfennigs (about 3½ c.) per cubic meter, and uniform quarterly rate of 4 marks (93 c.) for a certain frontage. The city brings the water to within two meters (6 2-3 feet) of household, and furnishes meters free of charge.

The book value of all the plants is 59,000,000 marks, or $14,160,000. The receipts last year were 79,000,000 marks, or $1,680,000, and the net profits paid into the city treasury 2,000,000 marks, or $480,000. To the above profit should be added value of water furnished free to the city, interest paid on book value of plants, amount of wear and tear and the annual sum set aside for amortization.

SITUATION IN VIENNA AND DRESDEN

In Vienna the gas works are entirely owned and operated by the city, but they are formed into a separate concern. The city gets gas for street lamps free, but pays for all other gas used at cost. Consumers pay 19 heller (4 c.) for illuminating and 14 heller (2.80 c.) for heating purposes per cubic meter. The cost of repairing, enlarging, interest and the amount to be paid to the city in ninety annual installments being deducted, the remaining profit was 12 per cent. on the outlay after furnishing light for street lamps free of cost to the city. The profit of course goes into the city treasury.

The water works of Vienna also belong to the city and pay a considerable sum annually into the city treasury.

In the city of Dresden the water is supplied by the city, which owns all the works and pipe lines. The city pays to the City Water

* Written for the *Merchant's Review* of San Francisco.

Company for all water it uses at a discount of 10 per cent. on common rates, which common rate is 10 pfennigs (2½ c.) per cubic meter. The rates to consumers are reduced when profits increase.

Receipts in the year ending 1900	$399,268
Profits in the year ending 1900	143,854
Receipts in the year ending 1901	397,033
Profits in the year ending 1901	131,904

The cost of gas in Dresden to consumers for illuminating purposes is 16 pfennigs (4 c.) and for heating purposes 12 pfennigs, (3 c.) per cubic meter. The city pays cost price, 8 pfennigs (2 c.) per cubic meter.

Profit paid into the city treasury	$263,000
Enlargement fund	164,000
Written off for wear and tear	115,000
Gross profits, last year	$542,000

Dresden City Electrical Works for illumination show this result for the past year:

Cash profit paid into the treasury	$33,600
Enlargement fund	36,000
Wear and tear	47,280
Interest account	43,440
Gross profits	$160,320

For power purposes during the past year, following is the result:

Cash paid into city treasury	$54,720
Enlargement fund	24,000
Interest	42,000
Wear and tear	73,680
Gross profits	$194,400

THE JEFFERSON MEMORIAL ROAD

Good Roads Train Finishes Southern Trip—Convention at Charlottesville, Va.—Many Celebrities Present—General Miles and Senator Hanna Talk Good Roads—Fitz-Hugh Lee Enthusiastic for Better Highways

By Our Special Correspondent

THE railroad corporations of the country are now to be numbered among the patron saints of good roads. Last spring the Illinois Central led the way by fitting up a good roads train with the co-operation of the National Good Roads Association, which made a trip from New Orleans northward to Chicago, which has become

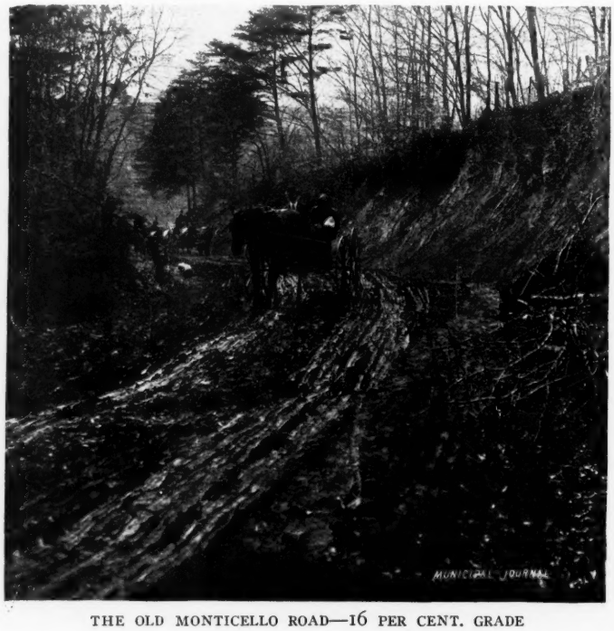
W. H. MOORE, MARTIN DODGE, R. W. RICHARDSON

historic, and has been fully described in former numbers of THE MUNICIPAL JOURNAL. The most recent convert among railway corporations to the good roads cause, is the Southern Railway. Last November it equipped a train of some fifteen cars with the best good roads machinery to be found in this country, and started out over a southern route, under the protecting wings of the National Government as represented by the Hon. Martin Dodge, Director of Public Road Inquiries, and of the National Good Roads Association, of which Col. W. H. Moore is the President, and Mr. R. W. Richardson, Secretary. The first trip lasted until the holidays, after which a second trip was commenced, which was completed at the last stop under spectacular conditions at Charlottesville, Virginia, where a three days' convention was held, the most successful of the series.

LOCAL PRIDE APPEALED TO

Here the local pride was thoroughly interested and aroused by the fact that the sample good road to be laid was to be the beginning of a highway leading from that city to the home and tomb of Thomas Jefferson. The convention was held on April 2d, 3rd and 4th with thousands of visitors from a distance and nearby in attendance. A special train was run from Washington on two days, which brought a large number of celebrities, including General Nelson A. Miles and Senator Marcus A. Hanna. General Fitzhugh Lee, who is President of the Jefferson Memorial Asseociation, presided at all the meetings. The Jefferson Memorial Association was formed about a year ago at the suggestion of Lieut. C. P. Shaw, a retired officer of the United States Navy, who has his home near Charlottesville. A grand boulevard leading from Charlottesville to Monticello was planned, and this roadway is to be considered simply a beginning toward a park system which will lead all the way from the little Virginian city up to the former home of Jefferson. The old road leading to Monticello had to be re-located in order to change the grade, as in some points there was found an 18 per cent. grade. The steepest grade in the new road will not exceed 4 per cent., which will allow any one to ride from the city to the home of Jefferson, on a wheel, without dismounting. The accompanying illustrations are made from photographs which were taken during the progress of the laying of the first stretch of the new road. They are good illustrations of the work which is being performed by the National Good Roads Association in its migrations about the country on good roads trains.

The old road from Charlottesville to Monticello was never laid out. It seems to have developed from a bridle path and it is evident that Jefferson and his friends must have mainly traveled between



THE OLD MONTICELLO ROAD—16 PER CENT. GRADE

SUB-GRADE AND FIRST COURSE OF MACADAM ON THE JEFFERSON MEMORIAL ROAD

his home and the village on horseback rather than by coaches and carriages. In several places the road has a grade of eighteen feet to the one hundred and this heavy grade through deep clay soil of that section of Virginia makes the road at many seasons of the year almost impassable. The first thing was the laying out of a new roadway following the contour of the land circling around the mountain side. The result was a route very little longer than the old one and with a maximum grade of not over four feet and that reached in only one place. When entirely completed it will be quite possible for teams to trot all the way from the University of Virginia to the mansion at Monticello.

THE SOUTHERN RAILWAY HELPS THE CAUSE

As soon as it was known that the Southern Railway had determined to send out a good roads train the Jefferson Memorial Association and Director Dodge of the office of Public Road Inquiries, and the National Good Roads Association, who had enlisted with them in this memorial road work, asked that a stop be made at Charlottesville to complete or at least do as much work upon the new highway as possible. The suggestion was readily acceded to and it was arranged that the work of the train should end at Charlottesville, and in connection with it there should be a general road convention. It turned out that it was a sort of jubilee occasion for the road making tourists who have been in the campaign for good roads in the south during the past six months.

Previous to the arrival of the train the engineering work had all been completed and a local force under the direction of the Memorial Association had done a great deal of the heavy grading on the section starting at the city line. This section at once branches off from the old road. Road making there as in other portions of Virginia in the Piedmont section with its great hills, which are at times practically mountains, and its deep red clay soil, is somewhat difficult. It would seem as if for such a highway as this Jefferson Memorial the only proper road is macadam. Fortunately there are nearby quarries of good stone, from which the macadam material can be obtained. A wide roadway was graded and the good roads train in its work laid a seventeen foot wide macadam. This macadam was eight inches deep; ditching was done and many culverts placed. At one place the new road was laid out directly through an orchard and it was necessary to take up many trees. In addition to the macadam work the good roads train crew graded about three quarters of a mile and prepared a large amount of roadway for the macadam and crushed additional stone. Four days were lost during the two weeks of the stay of the train from bad weather.

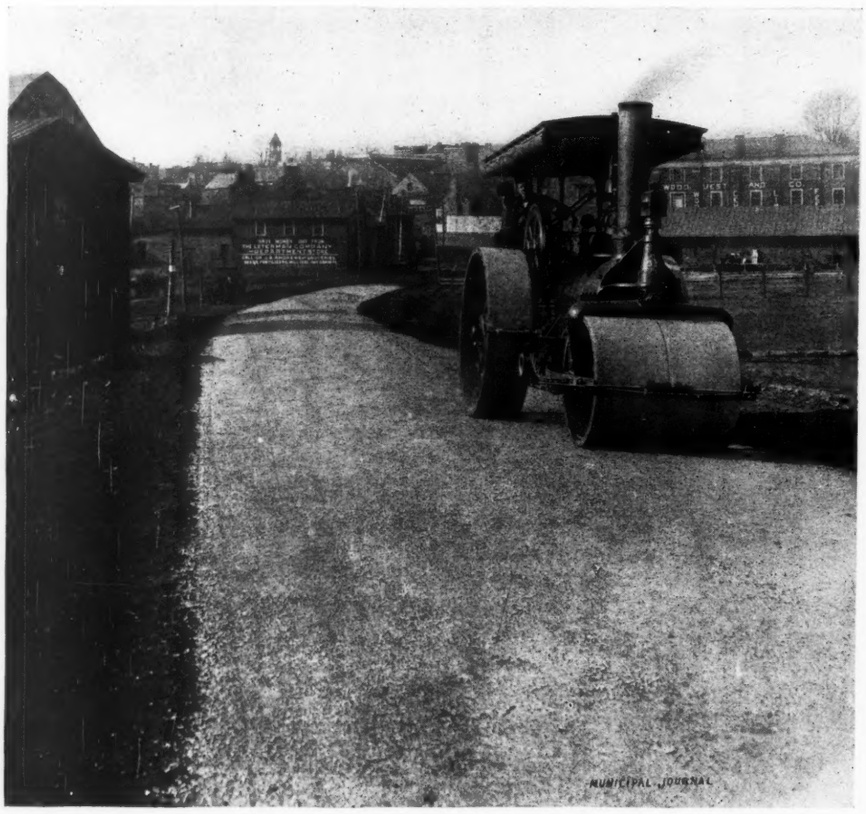
THE ROAD TO BE SOON COMPLETED

The Memorial Association has some additional funds, and is now engaged in raising more money with the expectation that the work will be pushed, and that within a very few months the entire macadam road will be completed to Jefferson's home. At one place, over Moore's creek, a fine memorial bridge will be constructed. Charlottesville and this section of Virginia have no improved road system and the Jefferson roadway will not only be a monument to the illustrious man whose name it commemorates, but also to the work of the good roads train and as well a practical object

FIRST COURSE OF MACADAM ON MEMORIAL ROAD

lesson to all that section of the state. This portion of Virginia is one of the most attractive of the whole commonwealth or of the south. The soil is generally good, it is a country well adapted for all kinds of stock raising as well as for grass, and on account of its nearness to Washington, is becoming a favorite section for men of money who desire country life in pleasant surroundings. The farm lands are very low in price and a great development is starting in here. Albermarle, of which Charlottesville is the seat, is one of the richest of Virginia's counties.

Charlottesville itself is an interesting town. The University there is the most famous of the southern educational institutions. It is a liberal university with many courses of study and always up to a very high standard. There are at present enrolled about 600 students. Its campus lies in one of the most beautiful locations in this section, overlooking a wide range of country and is in itself a scene of great beauty. From the dome of its historic library building, which was planned by Jefferson himself, can be seen the homes of Jefferson, Madison and the one time home of Monroe, the location of the birthplace of General Sumpter, the famous South Carolina revolutionary leader; of George Rogers Clark, the winner of the Northwest in the Revolutionary war and of his brother, Merriweather Clark and that of Lewis the co-partner of this latter Clark in the discovery of the Oregon country. It is here pointed out so that in this little city was the home of the four men, Jefferson, George Rogers Clark, Lewis and Clark, who added to the territory of the United States the great Northwest, comprising the states of Ohio, Indiana, Illinois, Michigan, Wisconsin and a portion of Minnesota, the great Louisiana Purchase and the entire Oregon and Pacific Northwest. Some day, if the dreams of many Charlottesville people and of others materialize, magnificent roads will connect the homes of Jefferson, Madison and Monroe.



FINISHING SAMPLE STRETCH ON MEMORIAL ROAD

THE MOST SUCCESSFUL CONVENTION

The convention at Charlottesville lasted three days. Every session drew large crowds, the attendance there being by far the largest at any of the Southern Good Roads conventions. The speeches were of a high order and in the main made by most distinguished men. The Southern Railway run a special complimentary train on Thursday and Friday of convention week from Washington to Charlottesville and return, carrying large numbers of distinguished people and other guests. Among the speakers were General Fitzhugh Lee, General Miles, Senator Mark Hanna, Hon. Martin Dodge, Assistant Secretary of Agriculture Brigham, Commissioner of the General Land Office Hermann, Representative Thomas H. Tongue, Robert J. Davis, Peter J. Otey, Charles E. Littlefield of Maine, Governor A. J. Montague of Virginia, President Samuel Spencer of the Southern Railway, President Stuyvesant Fish of the Illinois Central, President George W. Stevens of the Chesapeake & Ohio, President William M. Kennedy of the Pittsburg & Western and also of the Pittsburg Chamber of Commerce, Colonel William L. Dickinson of Massachusetts, Professor Harry Fielding Reid of Maryland, Dr. P. B. Barringer of the University of Virginia and many others.

Governor Montague in the course of his remarks quoted the following from Jefferson in a letter to Humboldt: "It is noblest, it is more remunerative, it is more splendid to spend your money in canals and good roads, that will build up and promote the social intercourse and commercial facilities of the people."

President Samuel Spencer of the Southern Railway in his remarks reviewed the work of the good roads train and spoke of the direct connection of the railroad to the common highway. He said: "The question of good roads is an economic and not a sentimental one. It is a directly practical one. In taking it up, America had lagged behind many other countries, especially European countries. Hence our prosperity as a nation did not begin until the advent of railroads. We built those rapidly, until now we lead the world in construction. Waterways had also received our attention, but our highways, the most important of all means of transportation, had received practically no attention until very recently. Now I am glad to say, the tide is turning to elementary means of transportation, to country roads, and these arteries of the nation are being given promising attention. The same ingenuity and force which has caused the construction of railways and canals will now be exerted in behalf of good roads and the present object of the government and the Good Roads train is to render all aid possible in their upbuilding. In all transportation the farmer has to do the first part and the railroads the second and the farmer's part is of supreme importance to him."

SENATOR HANNA TALKS GOOD ROADS

Senator Hanna spoke of the road question as follows: "The question of transportation in this great country of ours is serious. The surplus products must have a market and it is no wonder that our whole attention has been brought to solving the question of transportation of products. In common with our whole development it is a good work."

The sentiment in Virginia is growing and it is very probable that the next Legislature will pass a splendid road law. Indications point to the fact that with the employment of convicts on public roads throughout the South and with the efforts of the people in other directions that that section seems likely to soon be ahead of most Northern States in the matter of good highways.

THE UNICAMERAL MUNICIPAL LEGISLATIVE ASSEMBLY

Origin of the Double Council—High Time for a Change—Some of the Weak Points of the Present System—Experience Favors the Single Council

By Stoughton Bell *

THE proposition that the city of Cambridge adopt a form of government having but a single legislative board is one which has merit and will, I hope, command your attention. This board should be substituted for the Board of Aldermen and the Common Council now existing, and each member thereof should be elected, under the title of "Alderman," for a term of at least two years. Part of this board should be elected to represent the wards, as wards, and part to represent the city at large. How large the total membership of this board should be is a matter which should receive serious attention, for, on the one hand it is highly important that all the interests of the city should be properly represented, and on the other hand it is equally important that the membership should not be so large as to be unwieldy and delay the prompt transaction of business.

Since I became a member of the Common Council, I have corresponded and conversed with many of the mayors and clerks of the prominent cities of this Commonwealth, as well as with students of municipal government of recognized authority, and not only am I convinced that Cambridge should adopt at an early day the plan just outlined, but I am satisfied that if she does not do so now, the day when this step must be taken is not far distant.

ORIGIN OF THE DOUBLE COUNCIL

As near as can be ascertained the original intent of those who devised our city government was to follow the practice of our Federal and State governments, but the evils which the framers of these constitutions sought to avoid by the dual form of government cannot be given to-day as a reason for applying this system to our cities. Two legislative bodies were created in the United States government, both in imitation of the English form, and by way of compromise, for while some of the framers of the national constitution said that the United States government should represent the people, as people, and not as members of this or that state (that is, that the representatives should be apportioned according to the population and not according to the number of states), there were others who said that each state should have an equal number of representatives, irrespective of its size and population. In order to meet the demands of both these factions two legislative bodies were created, not with the idea that one body, as a body, should act as a check upon the other, but so that in one of the two bodies the people should be represented equally and impartially and in the other the states, as states, should be represented equally and impartially. In the first case the people elect their representatives, and in the second the state by its legislature elects its representatives.

To both houses of the legislature of the Commonwealth of Massachusetts representatives are elected by the people, and to neither house are they elected by counties or districts, either directly or by conventions. Further than that both houses sat together in one great assembly room until 1644, when it was voted "that the magistrates (now called Senators) may sit and act business by themselves." This was done, not that one body might act as a check upon the other, but on account of the disagreement between the two classes of members, arising out of the historically famous "pig" episode.

HIGH TIME FOR A CHANGE

In our present city council with two chambers the members of one branch are allotted to represent certain districts, while the members of the other are to represent the whole city. In the proposed change, just outlined, this same policy of representation is continued, but as all the representatives will compose one board, each will have the benefit of the knowledge and experience of every other member. The single board, moreover, need not be large enough to prevent the convenient and speedy transaction of business.

"The United States government," Dr. John Fiske well said, "is not the result of special creation, but of evolution." Equally true is this of our municipal government, and to what form of municipal government does the process of evolution lead us? The trend of modern legislation, not only in Massachusetts, but throughout the United States, is toward a change from the dual to the single legislative system in the government of municipalities. In this state alone the tendency to favor such a single system has of late been strongly marked. Of the five cities in Massachusetts which have received their first charters since 1878, only one, Pittsfield, chartered in 1899, has a dual system, and of the seven which have made radical changes in their charters since that date, all have adopted a single legislative body. Those which since 1887 have received their first charters are Quincy in 1888, Pittsfield in 1889, North Adams in 1895, and Melrose in 1900, while those which have amended their charters to replace the two chamber assembly by a single legislative body are Holyoke in 1896, Chicopee and Newtown in 1897, Chelsea, Somerville and Woburn in 1899, and Haverhill in 1901. In the majority of instances these are cities of comparatively few inhabitants, none with the exception of Somerville having more than fifty thousand. When we turn to the other states we find that so long ago as 1892 (I have been unable to get reliable data of a later date) Dr. Lewis G. Janes, a recognized authority, said that six of the ten chief cities of the country were governed by a single legislative body. Of the seventeen American municipalities which in 1892 had upwards of 200,000 inhabitants eleven had but one legislative body, and eighteen of the twenty-eight cities containing over 100,000 inhabitants had adopted the single, while ten adhered to the dual system. Of the 376 incorporated cities of more than 8,000 inhabitants 394 preferred the single and only eighty-two the bicameral system, while the 1,600 or more remaining cities in the United States, almost without exception, were governed by but one legislative body.

THE CITY LIKE A BUSINESS CORPORATION

A city is a business corporation, and like the directors of a business corporation those in whose hands its government is confided are under the prime obligation of administering its affairs in a business-like way for the best interests of its stockholders, the citizens. The prime qualities of its administration should be: first, Efficiency; second, Responsibility, direct and easily fixed; third, Facility in effecting results. Has the present form of the Cambridge city government these qualities?

Under the system now existing the greatest facility in effecting results is not obtained. To transact business an order is introduced and passed in one branch, and under the rules is kept by the clerk of that branch for thirty-six hours, during which time anyone who voted on the prevailing side may reconsider his vote. If a reconsideration is asked the order is held over until the next meeting. If no reconsideration is asked the order is forwarded at the expiration of the thirty-six hours to the clerk of the other branch, where, if passed, it must be retained for thirty-six hours more; it must then go to the mayor. As a result of this method, unless the rules are suspended, the order cannot be passed for at least a week after the first vote upon it has been taken. With the single board, the same rule, requiring that each order remain with the clerk for thirty-six hours after its passage would doubtless prevail, for it is highly proper that ample time for reconsideration should be given before the order is out of reach. After thirty-six hours, however, it could be at once sent to the mayor for his approval or veto, as the case may be, or if no action on his part were necessary it would then become a law.

In matters of a formal and concurrent nature which cannot wait, but have to be passed by both branches of the city council on the night when first introduced, the rules are suspended. As a result of this course, when one branch is about to adjourn notice is frequently received to wait for formal matters from the other branch requiring

* Alderman of the city of Cambridge, Mass. Substance of an address delivered before the Common Council of that city.

immediate attention. On the receipt of such a message, recess often times an hour or more in length is taken, subject to the call of the chair. As these routine matters go through, as of course, without a dissenting vote, it is unreasonable to detain the members of that board merely to furnish a quorum to concur with the other branch.

WHAT IS CLAIMED FOR THE DUAL BODY

What large railroad or manufacturing corporation or banking institution would consider even for a moment the cumbrous system of a dual board of trustees or directors in order that one should be "a check on the other." And yet this is apparently the strongest argument put forward by the advocates of a dual legislative system. What are the merits of this argument?

The fact that one body represents the city at large and the other represents limited localities may have a beneficial influence on legislation, in that the representatives of the city at large are likely to be less favorable to large expenditure of public funds for improvements in limited areas, while on the other hand, those representing these limited districts are less likely to favor expensive general improvements. This is also true of the single body, for a portion of the representation therein are elected by the whole city as are the aldermen to-day, and the rest are elected by wards or districts as are the common councilmen. Aside from the restraining influences just outlined, does either body act as a check upon the other in a healthy sense of the phrase? That is, does the influence of one body upon the other tend to hinder unwise or improper legislation? It is generally known that persons seeking to exercise improper influence to check legislation prefer the continuance of the dual system, since that furnishes small and select bodies, the control of either of which is more easily obtained and is quite as effective as the control of both, since each order must obtain a majority of votes in each body before it can become a law. One of the prominent corporation lawyers of this country was heard to say that if he could control the Senate of Massachusetts he could control the State. Is not that equally true of the city? If he can control either branch of the council he can control the city.

There are those who say that a city is not distinctly a business corporation, and that its governors are not like the directors of a corporation chosen from among the most able members thereof, but represent only the average ability of the stockholders. If this be true does it weaken any of the arguments put forth in favor of the single board?

In selecting men to represent the city in its council a great distinction is made between aldermen and common councilmen. In speaking of a candidate for the common council it is commonly said, "Oh, that is not important; he is only running for the common council," and yet what is the consequence? When that same man has served his one, two or three years in the common council, no matter how efficient a member of that body he may have been so long as he has done nothing absolutely bad, there is a very general feeling and a somewhat just one as far as sentiment goes, that he is entitled to a position in the board of aldermen. Thus good men in the city are defeated or refuse to run against him because they have not served an apprenticeship in the common council, and the board is weakened just so much because we keep in existence "A Training School for the Board."

And what is the value of the common council as a training school? There is no doubt that each year a man spends in city hall better educates him for the work of the next. However, the consensus of opinion where the single system has been tried is that the personnel of the board is no weaker, but very much stronger.

THE OPINION OF OTHERS

"Personally I believe it to be a great improvement over the two board system, as it expedites business, and the personnel of the board is improved," writes Mayor Davis, of Woburn.

Mayor Wilkinson, of North Adams, writes: "I cannot but feel that a single board is preferable, our business is transacted with promptness and dispatch while in (referring to another city having two boards and of which he has personal knowledge) business is often delayed by deadlocks which are usually broken by a compromise in some way, and this cannot always be done for the best interest of the city. During the fifty-six years of our existence as a city there has never been a deadlock or a tie vote in the city council. We have often congratulated ourselves that we have one board instead of two."

One of the great advantages of the single board is that a definite policy on the part of the city government could more easily be maintained; for the term of each alderman would be longer than one year and the expiration of the term of the several aldermen would be in alternate years. It is possible, although not probable, under the system now used in our city that the whole or a great majority of the members of the council of one year might be displaced by new men, which would be detrimental to the best interests of the city.

WEAK POINTS OF PRESENT SYSTEM

In the past year have been heard complaints about the weakness of the legislative department of the present city government. If this is so, and I do not admit it, could it not be explained, to a certain extent at least, by the fact that a majority are new men, some of whom though among the most able in the council, are unfamiliar with its workings, and are adjusting themselves to their new surroundings? Of the eleven aldermen we find only five of last year's board, and of the twenty councilmen we find but nine of those who before have served in that capacity.

The difference in value to the city between a man who is elected for a longer term is not to be overlooked in this connection. In both cases, for the first two or three months of his term he is at sea, and is trying to adjust himself to his surroundings. From the first of July to September is the summer recess. Within two months of the end of the recess his time and energy are devoted to the thought of re-election, for no man with ambition is satisfied to remain quiet and court defeat when he believes that by filling his office for a second year he can deport himself with more credit and satisfaction to himself and be of more value to his constituents.

On the other hand, if this same man is elected for two or more years his mind is not likely to be diverted by thoughts of re-election or other political preferment until the latter part of the second or third year, as the case may be. Then the citizens will have had more and better opportunities to measure him and decide on his qualifications for another term. Furthermore, citizens will weigh more carefully a condidate's qualification than is likely to be done to-day, before electing him for a term longer than one year. Of one unworthy to hold the office the voters of to-day are apt to say: "He is elected for only a year, we can displace him, if we so desire, at the end of that time." But he has taken the first step, and it is not easy to displace him.

Again, having been elected for a two years term, in most instances he considers that service enough and during that term it is not necessary for him to look out for future political "fences," and he is not likely to be easily influenced by outside pressure.

EXPERIENCE FAVORS SINGLE COUNCIL

Experience in other cities shows that those who compose the single body feel more responsibility, and each man gives more thought and consideration to the vote which he casts. I have received a number of letters from mayors which bear out this assertion, but I regret that with them came the request that the writer wished not to be quoted.

Thus we have seen in the words of the mayor of one of our prominent cities. "The principal advantage in a single board is in expediting the city's business," and this with an added responsibility on the shoulders of each member of the legislative department, with greater efficiency in the individual, and with a decreased opportunity for political log-rolling. We have seen that the so-called check by one body upon the other is nothing but the shifting of responsibility from the members of one board to those of the other, and in order that it may be continued to the legislative department is rendered unwieldy and cumbersome, and this check so far as it is healthy is continued under the proposed plan, with an improved personnel of the board of aldermen.

The valuation of property in the city of Cambridge amounts to more than $94,500,000 and the city council receives and disburses more than $3,000,000. Where is there a business corporation whose stockholders find it necessary to place such a trust in the hands of two boards of directors? Do not all business men agree that a corporation run in such a way would be disastrous?

Ex-Mayor Bothfield, of Newton, Mass., has this to say: "The city

of Newton has been working under a one board government since January, '93, with a greater degree of success than existed under the two board form. I was chairman of a commission to revise the charter which commission spent much time and thought upon the matter during '98 and '97 and our present charter is the result of that work.

"I am, however, firmly of the opinion that such a charter as Newton is now living under gives better results than a charter with two boards which exercise both legislative and executive powers, as was the case with us and is the case with most of the charters in the smaller cities. . . . One of the main arguments in favor of a two board government is that hasty legislation is prevented. This was not the case with us, as it merely required the suspension of the rules of either body to rush anything through."

CORRECT ASPHALT PAVEMENT SPECIFICATIONS

Trade Brands or Names Have No Place in Specifications—Scientific Standard the Only True Test—Tests Recommended to Prevent Fraud—Discussion of This Subject Earnestly Invited

By J. W. Howard, B. L., C. E.

Competition in asphalt paving with a certainty of getting good pavements can be secured by removing from the specifications and contracts all mention of the names of one or more sources of supply or brands of asphalt as acceptable, or as models for others, and inserting a list of chemical and physical tests, to which the asphalt and other materials must be subjected before acceptance by the city as suitable for the construction of pavements.

EXPERIENCE IS THE BEST TEACHER

Asphalt pavements of several kinds have been successfully laid in Europe for forty-six years and in America for thirty years; long enough to establish well defined tests by which the materials can be determined in advance as to their suitability for paving.

When first laid in Europe, the same mistake, due to limited knowledge, was made as in cities of America. The specifications of France first called for what was there termed "asphalte," a natural asphaltic limestone from a certain deposit or quarry, which, although good for paving, was not the only one at hand. As soon as asphalt pavement on the European system of powdered asphaltic limestone, heated and compressed on the street, entered London, Berlin, and other cities, the engineers began to admit other asphalts by name, with unfortunate results, the same as we see at present in the United States.

PRIVATE CONTENTIONS INVOLVE PUBLIC INTERESTS

There arose a bitter dispute and contention between the owners and users of the many sources of supply of reliable rock asphalts, etc., in Europe. The cities became involved in the private discussions and lawsuits. The solution was to cease to specify names, brands or trade-marks of asphalts, as well as other materials used in the pavements and to call for supplies subject to defined tests and requirements. To-day the asphaltic pavements of Europe are better laid and maintained than ever and at moderate but living prices, to the advantage of all concerned, especially the cities.

AMERICAN EXPERIENCE

In America we are passing through the same stages in connection with asphalt pavements, although our system of preparing the pavement is different from European methods. The general system in America is to make a hot mixture of sand, powdered stone and asphaltic cement, spread and compressed on the street. Our specifications at first were those recommended by the management of one large company and a few others allied with it or imitating it. The asphalt used came at first principally from one or another of the deposits in the same general quarter. City officials and engineers who had no knowledge of asphalt, except that supplied them by those commercially interested, found it easiest to specify the asphalt by name.

TECHNICAL KNOWLEDGE AVAILABLE FOR SPECIFICATIONS

Cities can now get able asphalt experts or expert knowledge to help rewrite their asphalt pavement specifications and contract forms, so as to admit any good asphalt and other standard materials needed to make reliable and economic pavements without reference to name of deposit, source or ownership. Every board of aldermen, board of works or other administrative body, should order its city engineer to call in expert assistance, if necessary, and draw up definite independent specifications for asphalt pavements with detailed tests for materials to be used; also, the methods of preparation, laying and maintenance. All reference to crude and even refined asphalts should be omitted. Crude asphalt varies in each deposit. Refined asphalt varies in each refinery and from season to season in the same refinery.

CONCENTRATE TESTS ON THE ASPHALTIC CEMENT

It is upon the asphaltic cement that the tests should be concentrated, because, as hydraulic or Portland cement holds together the sand and stone of the foundation, so the asphaltic cement holds together the sand and stone dust of the pavement mixture. The asphaltic cement can be tested by as definite standards as the Portland cement. Who would think of advertising for competitive bids for Portland or common cements by naming the brands?

The requirements as to the sand, stone dust, crushed stone and other components and how to use them must not be forgotten. If all bidders should combine, which is hardly possible, no city official could be suspected of favoring any brand or kind of asphalt. Moreover, asphalt paving contractors would soon learn, as sewer, water works, stone, macadam and other contractors have learned, that the city knows what is needed to make a good asphalt pavement as well as other kinds of public work, and the contractors would soon cease to either bid excessive prices or ruinously low prices, both of which do so much harm to city and contractor alike. It is not the intention nor policy of any city to be robbed or to rob those who do its public work. A fair profit is allowable and needed to assure to the city good and lasting results.

This subject is so important to the cities that it should be thoroughly discussed by city engineers and all who are interested in evolving a series of standard tests for the materials of asphalt pavements.

THE PRINCIPAL TESTS FOR STANDARDS

Among other tests we must consider specific gravity, quantity of bitumen by solution in carbon disulphide, solubility in a standard petroleum ether, melting and flowing temperature, viscosity, ductility, density, softness by penetration or equivalent test, stability under continued heat or a form of distillation. These and other tests can be applied to the refined asphalt and the flux of residuum oil maltha, etc., but they should be particularly applied to the asphaltic cement, because that is what goes directly into the pavement and is subject to the practical conditions of actual use.

The kind, sizes and proportions of the sand and stone dust and their manipulations must be determined and specified the same as the managers of paving companies prescribe for their use when giving instructions to their employees concerning paving mixtures, etc. In brief, that which is required by all well administered paving companies should be required in the printed specifications of cities. There are no longer any asphalt patents nor secrets. Cities cannot legally advertise for patented pavements, nor is it necessary to do so, nor should they call for brands nor make a private product of a deposit or refinery a model for competition.

Refined asphalts and asphaltic cements, some inferior and some superior to those in use, are being found and presented. As transportation improves, asphalt supplies from distant points will increase. But with standard technical and complete specifications our cities will be sure to accept only that which is good and lasting. This is the only safe policy. It will be approved by the taxpayers and by all honest paving companies also. Change the specifications. Make them complete, scientific and modern.

AMONG THE IMPROVEMENT CLUBS

"The Model City" at St. Louis Fair—Idea of Municipal Art Society Likely to Be Accepted—Splendid Work of New York's Tree Planting Association—Secures Passage of Important Legislation

By Charles R. Lamb

If the Municipal Art Society of New York City, through its special committee, succeeds in securing the adoption of its plans for what has been popularly called "The Model City Exhibit" at the St. Louis Exposition, it will have performed a service of inestimable value to the municipalities of this country. The scheme was first presented to the Pan-American Exposition authorities three years ago by a member of the Municipal Art Society. At that time it excited wide comment in the press and was looked upon with general favor. Although the idea met the approval of those outside of the exposition, including ex-Mayors Low and Strong, Richard Watson Gilder, Dr. Albert Shaw, Prof. Edmund J. James of the Chicago University, Prof. L. S. Rowe of the University of Pennsylvania, and many others, and although Governor Roosevelt recommended an appropriation for the installation of such an exhibit, the Pan-American authorities were unable to adopt it on account of the additional expense entailed.

This campaign, however, was not without its effect. When the Municipal Art Society took up the project last year and presented it to the St. Louis World's Fair authorities, and when it was announced to the public again, it struck a popular chord and has met with universal approval.

A committee has been at work for several months and only recently submitted its preliminary report to the World's Fair authorities at St. Louis. This provides for an exhibit which will include every phase of municipal life; systems of government will be graphically portrayed by means of charts, diagrams, model charters, etc.; uniform municipal accounting, so important to the financial welfare of the modern city, will be set forth; the department of public safety, which includes fire, police and health protection, is outlined in a most interesting manner; public utilities, such as water, light, transportation, telephone, telegraph, heating, refrigeration, garbage collection and disposal, and even a municipal crematory for the disposal of the dead, are included. The plan, as suggested, can be made of practical value to the exposition itself. In fact, it is recommended that as nearly all of them will of necessity be employed more or less in the actual working of the exposition, that they be made models of their kind and so teach an important lesson to the millions of visitors to the Fair.

Every question relating to the construction and maintenance of pavements, the kind and location of fixtures, public comfort stations and conveniences, as well as the general æsthetic treatment of the street, is taken up in a manner which cannot fail to appeal to those interested in the practical development of municipalities. Sanitation, charities and corrections, tenements and housing, building and inspection—everything which pertains to the building and maintenance of the modern city—are included among the suggestions.

It has been shown by this committee that the Model City can be so planned as to include any or all of the ideas suggested, and that if carried out in its ideal completeness, will present a grand object lesson which will form one comprehensive and attractive whole.

Tree Planting in New York City

The annual report of the Tree Planting Association of New York City, which was incorporated in 1897, contains much interesting information, not the least of which is found in a letter addressed to the association from Mr. Gifford Pinchot, who is connected with the United States Bureau of Forestry, Washington, D. C. He makes the

THE BARRENNESS OF A TYPICAL NEW YORK STREET

statement, "The planting of shade trees in the streets of large cities like New York is not only desirable but thoroughly practical. Trees are the only growing things that can be maintained in the more crowded streets of a great city and therefore, outside the parks and areas, the only form through which the residents of the city can come in daily contact with nature as we know it in the woods and fields. Street tree planting is even more essential in the crowded tenement districts than in other residence streets. I am glad the Tree Planting Association of New York is working so earnestly to improve the liveable quality of the city and I believe thoroughly in its ultimate success. If the Tree Planting Association can continue to demonstrate, as it is doing, the practicability of its plan it will have rendered a service whose advantages will spread far beyond the limits of New York."

This Association has performed excellent work since its organization, and has had many important committees at work in different sections of the city. Besides giving a lot of useful and technical information as to the manner of planting trees, a subject which was thoroughly covered in a contributed article in the April issue of the MUNICIPAL JOURNAL AND ENGINEER by Mr. Lewis Collins of Brooklyn, it contains the names and addresses of those who can and do supply trees in the city. For instance, one concern says: "We will furnish and plant according to the specifications by the Tree Planting Association of New York, a North Carolina poplar tree, size two and one-half by three inches caliper, fifteen to eighteen feet high, good, perfect tree, care for and guarantee same for two years, for $18. Maple and linden trees, same size and dimensions for $20 each." Similar propositions are made for the different trees for different periods of time down to a one-year guarantee. The firms whose names are given are only such as can be indorsed by the Society. This is a precaution which all Tree Planting Associations should be careful to take, so that people desiring to plant trees in the city will not be imposed upon. Through the courtesy of the President, Mr. Cornelius Mitchell, we are enabled to show two streets of New York, one being barren of tree life, and the other where vigorous young trees have recently been planted.

VIGOROUS YOUNG TREES ON FIFTH AVENUE

SECURES PASSAGE OF NEW LAW

This Society, during the recent session of the New York State Legislature, secured the passage of an act "to extend the jurisdiction of the Park Board of the city of New York to the preservation, planting and cultivation of trees and vegetation in the streets thereof for the purpose of improving the public health," We are pleased to report that this measure has already received the approval of Governor Odell, and that the act will take effect immediately. It provides that the Commissioners of Parks shall establish a bureau in the Department of Parks to be known as the "Bureau of Tree Culture, which shall be devoted to the preservation, planting and cultivation of trees and vegetation now under the control and care of the Commissioners of Parks, as well as of trees which may be planted in the future. Perhaps the most important condition included in the act is that the chief officer of this bureau shall be a person of skill and experience in the cultivation of trees. It is proposed to have small nurseries in different parks where they may be conducted without detriment to the park themselves, for the cultivation of tree plants of the varieties which are best adapted to the various localities in the city. The act confers the power upon the Park Board of establishing general rules and regulations for the planting and cultivation of trees throughout Greater New York, and it provides that ordinances shall be enacted for the protection of street trees, and any person violating any of such ordinances shall be guilty of a misdemeanor, who shall, on conviction thereof before a city magistrate, be punished by a fine not exceeding $50, or, in default of payment of such fine, by imprisonment not to exceed thirty days. The Police Board of the city is required to cause all officers on duty in the several parks to be vigilant at all times in the enforcement of the ordinances of the Park Board for the protection of street trees. The Park Board is required to include in its annual estimates for the support of the Department of Parks, such sums of money as will enable the Commissioners of Parks to perform the duties imposed by this act with diligence and success. Those cities which are without such a law will act wisely in following the example of the Empire State.

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SPEED REGULATIONS FOR AUTOMOBILES

THE numerous and radically different state laws and city and town ordinances regulating the speed of automobiles which now exist in this country present a striking picture of the widely divergent opinions upon the subject. Some of these laws indicate on the part of the framers a lack of knowledge of this new method of locomotion, which must of necessity be regulated and dealt with along twentieth century lines.

The State of New York has a general law restricting the speed of motor vehicles, whatever their source of motive power, to eight miles per hour within cities and incorporated villages and twenty miles per hour outside of cities and villages, but allows such cities and villages to grant, by ordinance, a speed in excess of eight miles per hour within their limits, if they so wish.

The State of Connecticut by a general law allows a speed of twelve miles per hour within cities and fifteen miles per hour outside of cities, but prohibits any city, town or borough from passing any general ordinances restricting the speed of motor vehicles on the highways. It provides, however, that any city, town or borough may, upon any special occasion or, whenever in its judgment it may be deemed advisable, grant permits to run motor vehicles at any rate of speed, under proper safeguards, during a specified time and upon specified portions of the highways within such municipality. The framers of this law were the first in this country to recognize and appreciate the great influence of road contests in the development and perfecting of the automobile. Other states and municipalities would do well to follow this example.

The State of New Jersey has no general law restricting speed, but the Board of Freeholders of the several counties may adopt such ordinances as they deem reasonable.

The State of Massachusetts, like New Jersey, has no general law regulating speed, but permits cities and towns to adopt regulations prohibiting the driving of automobiles at a rate of speed deemed inconsistent with public safety or convenience.

The State of Rhode Island has now pending before its legislature a bill modeled on the same lines as the Connecticut law, and embodying the provision of allowing cities and towns to grant special permits for speed trials on the highways.

Various other cities throughout the United States, in states where no general law has been enacted, have adopted ordinances restricting speed to six and eight miles an hour in the compact or built up parts of cities, and twelve to fifteen miles in the outlying sections. While some are more liberal than others in their provisions, there is perhaps no single ordinance that combines what may be considered an altogether reasonable regulation.

It is safe to assume that a fair and just regulation will not be framed until the superior control of the motor vehicle in stopping and starting and its perfect dirigibility, as compared with the horse-drawn vehicle, is fully recognized and well established in the minds of our law makers It is this very point of control on which is based the claim that the motor vehicle should be entitled to run at greater speed on the highways than the horse-drawn vehicle. It should be remembered that by means of foot and hand brakes it is possible to bring a motor vehicle to a full stop, when running at a speed of fifteen miles an hour, in one and a fifth times its own length, and when runing at a speed of from eighteen to twenty miles per hour in two and three-fourths times its own length. Results of most exhaustive brake contests show that motor cars can, on an average, be stopped when traveling at twenty miles per hour in less distance than the ordinary horse-drawn vehicle could be stopped when traveling ten miles per hour. It is a natural sequence that a law or ordinance regulating the use of automobiles on the highways will not be enacted in any community until the motor vehicle has found its way into such community in sufficient numbers to call for municipal regulation. This being the case, if officials whose duty it is to frame such ordinances would acquaint themselves with the workings of the automobile, taken in connection with a review of what other communities have done in this direction, it would go far toward enabling them to formulate a reasonable and just ordinance. This can, in most cases, be quickly and satisfactorily accomplished through the local automobile clubs which are springing up in all the large cities of the United States, whose chief function should be to impart to their local legislators a full knowledge of the vehicle for which they seek greater privileges on the highways, or by addressing the editor of THE MUNICIPAL JOURNAL AND ENGINEER.

Perhaps the nearest to an ideal regulation would be a limit of twelve miles an hour in the built up portions of cities and twenty miles an hour in the unbuilt up portions, with the privilege to run beyond these speeds between cities and villages, safeguarding such privilege by an enforcement of the common law provision covering the general use of the highway—that no vehicle shall be driven at a greater speed than is reasonable and proper having regard to the traffic and use of the highways, or so as to endanger the life or limb of any person. These conditions are most nearly approached in France, where a speed of eight miles an hour is allowed in the compact part of cities and twenty miles an hour in the outlying portions, while still greater speeds are permissible on the open highway between cities and villages, predicated upon proper regard being given to such traffic as may be met with thereon. It is no doubt due to this liberality as to speed, encouraging the use and contest of motors on the highway, that the automobile in France has been brought to the high degree of perfection which it now enjoys. It is conversely true that the development of the automobile in Great Britain has been greatly retarded by restrictive laws in reference to its use on the highways, the limit of speed to-day in England and Ireland being twelve miles per hour, and in Scotland, ten miles.

A further point which could well be considered by those who frame our laws is the education of the horse. The passage of a regulation which is liberal in its provisions and which encourages the use of the automobile in the city street and on the country highway in the greatest numbers, will better and more quickly accomplish this education than any other method. With the education of the horse the one great objection to speed on the highways—the frightening of those animals which are unused to the sight of a mechanically propelled vehicle—falls to the ground and accidents therefrom become a thing of the past.

With the coming of motor vehicles in greater numbers in every section of the country as a result of the encouragement to be found in liberal regulations for its use, collaterally will come the building of improved highways on which to run them, and improved highways mean a cheapening of transportation to the farmer and increased commercial, educational and social advantages to every

member of a community. This one feature alone is a potent argument in favor of the passage of laws which will vigorously encourage the adoption of this the coming method of transportation in every department of commercial and social endeavor.

As we are, perhaps, the most progressive of the nations of the world, it is to be hoped that we will not hinder and encumber the rapid introduction of this new locomotion by unreasonable and restrictive laws, denying it the free use of the highways for its development to the highest possible state of perfection, but keep step with the march of progress of the twentieth century by enacting reasonable and liberal regulation.

S. M. Butler.

THE VALUE OF FRANCHISES

For a long time it has been the practice of many municipalities to dispose of franchises for public utilities, such as water, light, transportation and telephone, at a very low price as compared with their real value. It is one of the hopeful signs of the times that various cities are correcting this evil and endeavoring to dispose of public franchises at somewhere near their right value.

In commenting upon the scheme of capitalization adopted by the United Railways of San Francisco, our esteemed contemporary, *The Chronicle,* of that city, remarks: "This affords an excellent opportunity to see what it means when a city gives away a franchise to a street railway company. And the first lesson is derived from the fact that, in the light of knowledge of the actual cash investment, it is not possible to state even approximately, the profits, every dollar of which should have been received by the city, but which have been diverted to private pockets. The lesson is that under no pretense and under no circumstances should a new franchise be given or an old one extended without making it an essential condition of the grant that the entire business of the companies obtaining the franchise shall be as public as the accounts of the city, and subject to public audit. We may never learn what we have lost in times past, but it will be the fault of the Mayor and Supervisors if in the future we do not know every detail of the financial history of our public utility corporations.

"In taking over the railroad systems the new company assumes an indebtedness of $6,950,000 5 and 6 per cent. bonds of the constituent companies of the Market-street combination, $5,124,000 Market-street bonds issued since the consolidation, and $1,000,000 of the Sutter-street company, aggregating $13,074,000. This may roughly be estimated to indicate the cost of the roads. It is probable that some money was paid in for stock, but until the companies show from their books exactly how much this was it is not to be considered in estimating equities. In addition, it has purchased the Sutro road, on which there is no debt and a stock liability of but $400,000, and the San Mateo road, which has no debt. It cost the late owners $300,000 plus whatever has been expended upon it since 1896. It has probably cost about $1,500,000, and indicates a total outlay for producing the properties taken over by the United Railways of $15,974,000, plus whatever small amounts may have been paid in for stock. The Geary-street railroad seems suspended in the air. It has a bonded debt of $651,000, which does not mature until 1921, although its franchise is about to expire, which looks like queer financiering. Possibly the Market-street company assumed that debt, but, in any case, its plant may be good for it. Its stock is wiped out with the expiration of the franchise, which may be a good reason for not paying any great sum for the stock, but is not a reason for earning dividends on it at the expense of the public. Roughly, the late owners have made a profit of the difference between substantially the above cost of the properties and whatever they have received from the new owners. It is a lot of money, and it should have gone to the city, for it represents little but the capitalized value of the use of the streets. It is said that the outstanding bonded indebtedness of the corporations taken over is about $18,000,000, instead of less than $16,000,000, and it may be that recent expenditures on capital account have resulted in debt which will absorb bonds to that amount. It is also doubtless the fact that it is intended to devote some more actual money to extensions and betterments. Possibly the legitimate investment, including sums paid in on stock, may reach $25,000,000. It is pretty certain that it will not amount to more. Against this expenditure the new company expects to take from the city 4 per cent. per annum on $40,000,000 in bonds, with a sinking fund to pay the bonds at maturity—say $15,000,000 and interest in excess of the actual investment. Besides this there will be 4 per cent. on $20,000,000 preferred stock, and, it is hoped, 5 per cent on common stock, during the life of the franchises, and at their expiration the company will own many millions of dollars in a plant to be sold—if the franchise is not extended—for whatever it will bring. It is not desirable for the city to give such things away."

EDITORIAL COMMENT

Our exchanges record, with distressing regularity, reports of deaths and serious injuries by the street railway cars which are not equipped with the life-protecting air brake and fender. Municipal officials are quite as much to blame for these accidents as the street car companies themselves, for it comes within their jurisdiction to pass ordinances to prevent these daily accidents.

It is to be hoped that the municipal housecleaning now under way in St. Louis will be completed before the opening of the Fair, 1903. The recent revelations made by the Grand Jury in that city show an amount of municipal corruption quite up to the average of that found in Philadelphia and New York. We wish Mayor Wells the best of luck in his undertaking to bring about a cleaner state of affairs in his city.

For the past three years, it is reported, typhoid fever has cost the city of Pittsburgh, Pennsylvania, nearly $3,500,000. Still there are those in Pittsburgh who are now wasting their energy in protesting against a scheme to purify the city's water supply by filtration. Evidently the citizens of Pittsburgh do not value human life very highly. If the authorities, in the face of all opposition do not go ahead and install proper filtration system, it will be another case of municipal misrule.

Local newspapers report that Rochester, New York, had a soot storm a few days ago. This is what the dwellers in the average city may continue to expect so long as municipal officials remain indifferent to the passage and enforcement of ordinances regulating the smoke nuisance. One of the good things which may be said about New York is that it is not troubled with smoke or soot, although it has more manufacturing interests within its limits than any other municipality in the country. A little energy, intelligently directed, on the part of other cities, would achieve the same results.

This is the time of year when a systematic inspection of hotels, apartment houses, business buildings, factories, and other high and large buildings in cities and towns, should be made. Work of this kind really comes under the jurisdiction of the Mayor, who is the executive of every city or town, and should see that the rules and regulations respecting the safety and health of the general public, as involved in cases similar to the one mentioned, should be strictly enforced. If our chief executives were more careful in this particular there would be less loss of life and property by fire in our municipalities.

We have reason to believe that there is such general dissatisfaction throughout the country in the service rendered by the monopolistic telephone companies that the next step in this direction will be the municipalization of telephone systems. Many cities in the Old World already own and operate their own telephone systems in a profitable and satisfactory way and there is no reason why they should not be operated at a profit on this side of the Atlantic. The exorbitant rates charged by the Bell Telephone Company in various parts of the country are rapidly converting public sentiment to the municipal ownership idea.

THE New York Board of Aldermen has again shown its contempt of modern progress in defeating the passage of an air-cushion ordinance which required the construction of an air cushion at the bottom of every passenger elevator in the city. Many accidents occur every year in New York City by the falling of elevators. All of this could be avoided if the provisions of the proposed ordinance could be enforced. Perhaps if the company, or companies, which might profit by the introduction of an extensive system of air cushions throughout the city, should offer a sufficient amount to the opposing Aldermen the majority in favor of the ordinance might be secured.

MAYOR BARSTOW of Oakland, California, recently appointed a committee to investigate the subject of municipal ownership of a water supply. There ought not to be much doubt as to what kind of a report this committee will bring in—provided it does honest work—when it is taken into consideration that fully seventy per cent. of the water works plants in the country are owned and operated by cities, towns and villages. Any one who has made a study of municipal ownership, as applied to this particular public utility, cannot fail to have noticed that invariably the city and taxpayers obtain better results under public than under private ownership. We sincerely hope that Oakland may succeed in securing a water system of its own.

THOSE who are inclined to enter complaints against Mayor Low's administration of New York City, should bear in mind that he is laboring under great disadvantages. He not only is obliged to put up with the incompetent service of a lot of Tammany hold-overs, but has been actually hampered in repeated instances by the malicious attempts on the part of the former administration in carrying out his own ideas. The law does not permit him to turn out Tammany office holders, and for this reason he will have to continue the work at a disadvantage. Those who are inclined to criticise should possess their souls in patience. It should also be borne in mind that while everything as it exists to-day is not ideal, it is infinitely better than it would have been had Tammany succeeded at the last municipal election. Before passing judgment give the Administration twelve months' time.

THERE has been a great deal of talk about the water department of New York losing money by thefts. It has been extravagantly stated that more water was stolen from the department than was lost in any other way We feel no hesitation in saying that the people who make such a statement do not know what they are talking about. More water is wasted in New York City every year than is stolen, and it undoubtedly amounts to hundreds of thousands of dollars during every twelve months. People who talk against metres simply show their ignorance. Private water companies, which serve cities, towns and villages in various parts of the country—unless their water is distributed by gravity pressure—are very careful to introduce meters on every domestic service pipe, and they realize that meters do save water. What the water works department of New York needs to-day more than anything else is the installation of water meters. This would save the taxpayers of New York City hundreds of thousands of dollars every year.

OUR esteemed contemporary, *The Herald*, of Salt Lake City, makes an interesting argument in favor of placing electric light, telegraph and telephone wires under ground, in which we heartily agree; but we must call attention to a misstatement made in the editorial when it is said that "Up to this time no under ground trolley system has been devised that gives perfectly satisfactory results, that is, unless the car is placed under ground also. In time, though, some genius will make it possible to bury the trolley wires and then the different cities of the country will be freed from the dangerous overhead tangles that now mar them." In this statement our contemporary is evidently misinformed, for underground trolley systems have been in operation for years in the cities of New York and Washington, and have given the utmost satisfaction. The only obstacle which has prevented the rapid adoption of the underground system in other cities is the large expense involved. To construct an underground trolley requires at least double the expense of the overhead trolley, and this is a very serious difficulty which is not easily overcome.

LETTERS TO THE EDITOR

VOTING BOOTHS WANTED

——, N. Y., April 2, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

The city government is thinking of using portable booths for election this fall and, therefore, I would like to obtain the addresses of any firms that make booths.

JOHN J. FENWICK, *Alderman.*

The American Steel House Company, 790 Eleventh avenue, New York City, makes a specialty of portable voting booths. Other manufacturers are, American Portable House Co., Corona, N. Y.; Iron Cottage Company, Grand Rapids, Mich.; Henry B. Lewis, 39 East Atwater street, Detroit, Mich., and Knox Portable Building Co., 190 West 134th street, New York.—[EDITOR.

A CORRECTION

——, April 4, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

I beg to call attention to an error in your issue of April, on page 166, "Norfolk's Water Supply," in the statement, "The double trolley system has caused much electrolysis in the water pipes and report recommends that the double system of trolley be instituted." As I made the investigation and report I can say that they have a single trolley system in that city which has caused electrolysis. Your statement may lead to a wrong impression unless corrected. The report was in favor of the double trolley as stated, but the ordinance failed to pass the Council by one vote.

A. A. KNUDSON, E. E.

The word "double" was inadvertently substituted for the word single in writing the sentence to which attention is called. Most of the readers, however, would not be deceived by the mistake, we think, as the closing part of the sentence contains the statement that the double system of trolley was recommended. We are glad, however, to have the matter called to our attention.—[EDITOR.

BOOKS ON SANITATION

——, N. J., March 25, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

Have you ever published any articles on sewer systems in small towns, say from 2,500 to 5,000 people? If so, I would be glad to receive copies of your magazine containing such articles. Do you know of any recent books on the same subject?

M. T. RICHARDSON.

Nearly every issue of THE MUNICIPAL JOURNAL has had articles of value bearing upon this subject, but we are unable to send you the back numbers, as most of them are out of print. If you contemplate putting in a sewer in your town, the first and most important step for you to take is to secure the services of some competent sanitary engineer, who will make a survey for you and tell you more accurately than any book can just what you may need. By referring to the cards of sanitary engineers found in THE MUNICIPAL JOURNAL, you will secure the addresses of several who are eminently fitted to furnish the special information you desire. Among the books which bear upon the subject you will find the following more or less helpful: "Designing, Construction and Maintenance of Sewerage Systems," by A. Prescott Folwell, 8vo, 445 pp, cloth, $3.00, published by John Wiley & Sons, New York; "Elements of Sanitary Engineering," by Mansfield Merriam, Professor of Civil Engineering in Lehigh University, Second edition, 8vo, 222 pp, illustrated, cloth, $2.00, published by John Wiley & Sons, New York; "Sewer Designs," by H. N. Ogden, C. E., Assistant Professor Civil Engineer, Cornell University, 12mo, 234 pp, illustrated, cloth, $2.00, published by John Wiley & Sons, New York.[EDITOR.

FRANCHISE FOR HOT WATER HEATING WANTED

Editor, MUNICIPAL JOURNAL AND ENGINEER:

———, WIS., March 11, 1902.

There is before our city at the present time a franchise for hot water heating. I desire to examine into that question thoroughly so that I may be in position to advise our city in reference to the franchise so that I will be able to properly protect the city.

M. J. GILLEN, *City Attorney.*

In answer to the above question we give below a list of eighty-two plants located in different parts of the country, taken from the *Engineering News,* which furnish heat on a commercial basis. The special information desired may be secured by writing to the owners. —[EDITOR.

City or town.	Population.	Owner.	
Albert Lea, Minn..	4,500	Albert Lea El. Co	†
Alton, Ill.	14,210	Alton Ry., Gas & El. Lt. Co	†
Atlanta, Ga.	89,872	Atlanta Ry. & Power Co	†
Allentown, Pa.	35,416	Allentown Heat & Power Co	†
Bellefonte, Pa.	4,216	Bellefonte Gas Co	†
Bloomsburg, Pa.	6,170	Bloomsburg Steam Heat & El. Lt. Co	*
Bedford, Ind.	6,115	Heat, Lt. & Power Co	†
Bloomington, Ind.	6,460	Peoples Lt., Heat & Power Co	†
Belvidere, Ill.	6,937	Belvidere Htg. Co	*
Bloomington, Ill.	23,286	City Dist. Htg. Co	*
do.		Consumers Heat & El. Lt. Co	*
Bismarck, N. Dak..	3,319	Hughes El. Co	†
Boise, Idaho	5,957	Artesian Hot & Cold Water Co	†
Butte, Mont.	30,470	Phoenix El. Co	†
Geneva, N. Y.	10,433	Geneva Steam Htg. Co	*
Clearfield, Pa.	5,081	Clearfield Steam Htg. Co	*
Colorado Spgs., Col.	21,085	Colorado El. Co	†
Crookston, Minn.	5,359	Crookston W. Wks., Power & Lt. Co	†
Cedar Rapids, Ia..	25,656	Cedar Rapids El. Lt. & Power Co	†
Columbus, O.	125,560	Indianola Land & Power Co	*
Coshocton, O.	6,473	Merchants El. Lt. & Power Co	†
Champaign, Ill.	9,098	Champaign & Urbana Gas & El. Ry. Co	†
Denver, Col.	133,859	Denver Steam Htg. Co	*
Davenport, Ia.	35,254	Davenport Gas & El. Co	†
Des Moines, Ia.	62,139	Des Moines Steam Htg. Co	*
Danville, Ill.	16,354	Danville Gas, El. Lt. & St. Ry. Co	†
DeKalb, Ill.	5,904	DeKalb El. Co	†
Evanston, Ill.	19,259	Evanston Yaryan Co	*
Erie, Pa.	52,733	Home Htg. Co	*
Fredonia, N. Y.	4,127	Dunkirk & Fredonia R. R. Co	†
Greenville, Pa.	4,814	Peoples El. Lt., Heat & Power Co	†
Grinnell, Ia.	3,860	Carney & Hammond	†
Grand Forks, N.Dak.	7,652	Grand Forks Gas & El. Co	†
Harrisburg, Pa.	50,167	Harrisburg Steam Heat & Power Co	*
Hazelton, Pa.	14,230	Hazelton Steam Co	*
Indianapolis, Ind.	169,164	Home Heat & Lt. Co	*
Jerseyville, Ill.	3,517	Jerseyville Lt., Heat & Power Co	*
Johnstown, Pa.	35,936	Johnstown Power & Heat Co	*
Janesville, Wis.	13,185	Janesville El. Co	†
Kenosha, Wis.	11,606	Kenosha Gas & El. Co	†
La Crosse, Wis.	28,895	Central El. Co	†
La Porte, Ind.	7,113	La Porte El. Co	†
Lebanon, Pa.	17,628	Lebanon Steam Htg. Co	*
Lockport, N. Y.	16,581	American District Steam Htg. Co	*
La Salle, Ill.	10,446	Marquette Heat & Lt. Co	*
Laconia, N. H.	8,042	Belknap El. Power Co	*
Mason City, Ia.	6,746	Brice Gas & El. Co	†
Muscatine, Ia.	14,073	Muscatine El. Ry. Co	†
Mattoon, Ill.	9,622	Mattoon Heat, Lt. & Power Co	†
Mahanoy City, Pa..	13,504	Charles D. Kaier Co	*
Mt. Pleasant, Pa..	4,745	Peoples Htg. Co	*
Newark, N. Y.	4,578	Newark Lt., Heat & Power Co	†
New York, N. Y..	3,437,202	New York Steam Co	*
N. Tonawanda, N.Y.	9,069	The Fidelity Co	*
Owatonna, Minn.	5,561	Owatonna Gas, El. & Htg. Co	†
Perry, Ia.	3,986	Perry El. Lt., Power & Heat Co	†
Paris, Ill.	6,105	Paris Gas Lt. & Coke Co	†
Pontiac, Ill.	4,266	J. A. Carrothers, in charge	*
Phillipsburg, Pa.	3,266	Phillipsburg Steam Htg. Co	*
Pottsville, Pa.	15,710	Pottsville Steam Heat & Power Co	*
Pawtucket, R. I.	39,231	Pawtucket El Lt. Co	†
Reading, Pa.	78,961	Reading Steam Heat & Power Co	*
Red Oak, Ia.	4,355	Red Oak El. Co	†
Springfield, Mass.	62,059	Springfield El. Lt. Co	†
Scranton, Pa.	102,026	Economy Lt., Heat & Power Co	*
do.		Scranton Heat & Power Co. (?)	*
Shenandoah, Pa.	20,321	Shenandoah Heat & Power Co	*
Seattle, Wash.	80,671	Seattle Power & Heat Co	*
Springfield, Ill.	34,159	Springfield El. Lt. & Power Co	†
Towanda, Pa.	4,663	Not given	Not given
Topeka, Kan.	33,608	Edison Illum. Co	†
Terre Haute, Ind..	36,673	Terre Haute El. Co	†
Tiffin, O.	10,989	Edison El. Lt. & Power Co	†
Toledo, O.	131,822	Toledo Htg. & Ltg. Co	†
Taylorville, Ill.	4,248	Taylorville El Co	†
Urbana, Ill.	5,728	Urbana Lt., Heat & Power Co	*
Vincennes, Ind.	10,249	John Hartigan Co	*
Waxahatchie, Tex.	4,215	Waxahatchie El. Lt. Co	†
Washington C.H., O.	5,751	Washington Smead Hot Water Co	*
Washington, Pa.	7,670	Steam Htg. Co	*
Wilkes Barre, Pa..	51,721	Wilkes Barre Heat, Lt. & Power Co	*
Wilkinsburg, Pa.	11,866	Pennsylvania Heat & Power Co	*
York, Pa.	33,708	York County Traction Co	†
Youngstown, O.	44,885	Youngstown Steam Heating Co	*

* Independent.

† Combined with something else.

DO RIVERS PURIFY THEMSELVES?

NEW YORK, N. Y., April 20, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

In your last issue, in the article by William G. Bissell, on "Water, Water Supplies and Epidemics of Disease," he says: "The old idea that running water purifies itself to any extent is erroneous and personal observations along this line confirm the results obtained by many other investigators, that mechanical agitation and aeration play little or no part in the purification of water." I have read many books in which the opposite of this is maintained and have seen reservoirs of the Croton system where the water is allowed to play in the form of a fountain for the purpose of aeration before passing on its way to the city. I have also heard it said that a flow of twenty miles will purify a river of a moderate amount of sewage.

Both of these views cannot be correct, Mr. Editor, and I, for one, would like to see some of our experts give their opinions on the subject.

S. EDGAR THOMPSON.

The above letter is interesting from the fact that there is much difference of opinion regarding the self-purification of water in a river. Mr. John C. Thresh in "Water and Water Supplies," page 247, third edition, after reviewing the experiments that have been made relative to the self-purification of rivers, says: "The balance of evidence is decidedly on the side of those who uphold the theory of self-purification, and the diverse conclusions arrived at by different observers can be accounted for by the varied and often imperfect character of the experiments and by the diverse conditions that obtain in different streams." We shall be glad to learn the experience of other engineers on this important point.—[EDITOR.

HOW TO BUILD GRAVEL ROADS

———, N. W. T., April 7, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

Our town, which is small, there being only 2,600 population, has just passed a By-Law for the raising of $10,000 to be expended in street improvements. The soil is a very heavy clay, and in the spring and rainy seasons works up into a sticky and slippery mud. The only material that seems within our reach is gravel, which we can lay down at $1.25 per cubic yard. Now what I would like to know is what is the best method of putting on the gravel to make a good road? What grade do you recommend? Should the street be rolled, and how much? What kind of a roller should be used? How should the gravel be put on, in different layers or all at once, and how deep? Should it be well rolled? Should it be put on when the clay is dry? Can a good job be made of this material?

J. W. SMITH, *Mayor.*

It is difficult and almost impossible to give precisely the information desired, but if the following opinions shall aid in your work of improving the streets of Regina, which is apparently the commercial centre of that region, and which may, therefore, be expected to influence many other towns by the example which you set, we shall be gratified.

You can make a marked improvement with the $10,000 available if you proceed on about the lines indicated, but if you expend the money in merely spreading loose gravel upon your streets in their present form, there will be no lasting benefit, and the failure will discourage further "good roads" work in your town.

It is the first step that counts, and in this case the first step should be to get the tools necessary to any successful road work.

Probably none of your farmers would undertake to harvest his wheat crop with a cradle. Any of them would agree that a reaper and binder was necessary. Just so with a steam-roller and a horse-scraper, without which you will waste your efforts and money in trying to make a solid road. This advice has no reference to any desire that some one should sell you a roller or a scraper. It is only that you may not blame THE MUNICIPAL JOURNAL if you should try to save the cost of these machines, and result in wasting the whole sum spent and in having nothing to show for it. For your clayey soil, the roller should be rather less than over ten tons weight, and certainly should not exceed ten tons when loaded with fuel and water.

On your present streets there probably is now a top-layer which forms dust in dry weather and mud in wet weather. This layer of worn surface, three or four inches thick, should be scraped off and taken away.

This can best be done with a wheeled scraper. Such a scraper should also be used to round-up your roadway from the sides to the center, for a width of say 22 feet from the ditch at one side to the ditch at the other side. Where your stores are, this width should probably be 30 feet more, but the sides or ditches should be made about 12 inches lower than the center, so that water will drain from the center to the sides, and will then run off at once in drainage-ditches. These must be arranged so that no water can stand on the road, or by the side of the road.

When you have formed the clay road-bed in this rounded form, with centre about 12 inches higher than the sides, and when the water has drained or dried out of it, you should spread 3 or 4 inches of sand and small gravel over the surface of the clay, and then roll it until it is firm and hard; running the roller along the sides first, and in the center last, so as to "crown" the material.

The sand and small gravel will be mixed more or less with the clay, and render it less plastic and soft when wet. Meantime you should be getting your gravel ready to form the road-surface.

Your local conditions are in one way difficult, but are in other ways favorable. The alluvial formation which makes the soil of the Assiniboine Valley famed for its fertility, makes, when the frost comes out, a mud which is probably as sticky and slippery as any which can be found.

To offset this difficulty you are fortunate in having glacial-drift deposits of sand and of gravel which are near to Regina and with which you can stiffen and cover this clayey mud. When you later may wish to incur greater cost of broken stone roads, you can get from the great continental terminal moraine which forms the Missouri Coteau, lying 15 miles S. W. from Regina, erratic boulders and large gravels which you can crush to form a more costly but a more lasting road-surface than can be made with the local gravel.

The shale rocks which underlie your glacial deposits of gravel and boulders, and which outcrop at some points near Regina, are of no lasting value for road making, as they soon grind into clay and mud so that any time and money which may be expended in making shale roads is wasted.

The writer has not personally examined the glacial gravel near Regina, but it must vary in character in different deposits. The several gravel-banks should be examined critically, and that one should be chosen in which there is the least amount of shale or of sandstone and in which pebbles of granite, quartsite, syenite, and perhaps trap and porphyry predominate. In short, select the gravel which is hardest and toughest, and avoid that which is soft and brittle.

The gravel will probably be a mixture of all sizes, from sand up to 3-inch pebbles and perhaps larger. It must be screened into three sizes to give the best results.

To do this, if the gravel deposits are on level ground, you will have to set up hand-screens, and shovel the gravel through them.

If the gravel is in knolls, or on hillsides, you can do it best by combining all three screens in one long trough, say 2 feet wide and 24 feet long, and shoveling the gravel into and along it; the three sizes falling through the screens into bins beneath the trough.

Of course the usual way would be to buy with your steam-roller, a rotary screen, which would elevate the material and screen it, and spout it into bins from which it could be spouted into wagons for use.

The first screen should have holes three-quarter inch round or square, giving fine material, about half inch to sand; the second screen should have one and one-half-inch holes, giving material from three-quarters to one and one-half inch; the third screen should have three-inch holes, giving material from one and one-half to three inches. All larger than three inches will pass over this screen and will not be used.

You are then ready to cover the roadbed before described. Spread four inches of the largest gravel (one and one-half to three inches) over about 16 feet width of the rounded and firm and dry roadbed. Do not do this when it is wet and muddy. Cover, say 300 feet of the roadbed and at once roll it with the steam-roller and pack it together. When you have rolled it about eight or ten times, or until it seems as solid as you can get it, bring the fine gravel and sand and cover the rolled gravel an inch of it and then roll it again. Most of the sand will work into the gravel and disappear. Then spread about half an inch of sand and roll it again. This will fill most of the voids in the gravel and make it firm. Then cover the whole with a four-inch layer of the three-quarter to one and one-half inch gravel, and treat this in the same way. Roll it first, and then scatter the sand and fine stuff over the top and roll it in. When all is finished, cover the surface with an inch of the sand and small gravel as a wearing surface which must be renewed when needed.

A gravel road is never as durable as a road made of broken stone. If heavy loads on narrow tires are hauled over this road, ruts will be made, especially in the spring.

Whenever these ruts appear, you should have a man ready to fill them with gravel, and the roller should be brought out whenever there has been a heavy rain and the road should then be rolled while wet. This should also be done in the spring as soon as the frost comes out.

The roller can also be used to good advantage to roll the dirt roads in the spring, and thus make them smooth and hard through the summer.

With the $10,000 which you are to have available, you ought to be able to buy a roller and a scraper and to make two miles of gravel roads.

THE MUNICIPAL JOURNAL will be interested to know the action which you take and the results which you accomplish.—[EDITOR.

PERSONALITIES

—Mr. John Budd has been elected City Engineer of Des Moines, Iowa.

—Mr. Arthur C. Grover has been appointed City Engineer of Rutland, Vt.

—Rockville, Conn., has re-elected Mr. J. T. McKnight as its City Engineer.

—The Democrats of Milwaukee, Wis., re-elected Mayor David S. Rose as Mayor of the city.

—Mr. Thomas F. McCauley has been appointed City Engineer of Cedar Rapids, Ia., to succeed George H. Meredith.

—Dr. Harvey J. Burkhardt was elected Mayor of Batavia, N. Y., over the Democratic candidate, Mr. William J. Haitz.

—Mr. Emmet A. Steece, Assoc. M. Am. Soc. C. E., has been re-elected City Engineer of Burlington, Ia., by a large majority.

—The narrow margin of forty-five votes landed Mayor Earle, of Columbia, S. C., in the mayor's chair for the second time.

—Mayor Edward W. Hyde, of Bath, Me., has offered to give his year's salary toward the building of a much needed school house.

—The Republicans of Helena, Mont., have succeeded in re-electing as mayor, Hon. E. J. Edwards, as well as most of the city officials.

—Mayor Louis D. Campbell, of Tacoma, Wash., has been again elected head of that city by the Republican party by a substantial plurality.

—Mayor Hinchcliffe, of Paterson, N. J., has been appointed by Governor Murphy one of five commissioners to consider the cleansing of the Passaic river.

—The Hon. Milo M. Acker has been elected City Attorney of Hornellsville, N. Y., for a term of two years. Mr. Milton B. Smith has been reappointed City Clerk of the same city.

—Hon. George R. Perry, Mayor of Grand Rapids, Mich., was defeated at the recent election by Mr. W. Millard Palmer. Mayor Perry says that he will support the new administration.

—The new mayors in Pennsylvania cities are: Carbondale, Hon. James J. O'Neill; Wilkes Barre, Charles H. Price; Chester, Mr. Howard H. Houston; Williamsport, Mr. John F. Laedlein; Johnstown, Mr. John Pendry.

—Mayor Carter H. Harrison, of Chicago, says he is weary of his office and that new blood is needed in the Mayor's chair. According

to this it is not likely that Mayor Harrison will be a candidate for re-election next spring.

—Clean streets is one of the things Mayor Drennen of Birmingham, Ala., urges in his annual report. He says city convicts should be used to clean the streets and that a stockade be erected for the use of these men at night.

—The Boston Society of Civil Engineers has elected the following officers: President, Mr. George A. Kimball; vice-president, Mr. Fred Brooks; secretary, Mr. S. Everett Tinkham; treasurer, Mr. Edward W. Howe; librarian, Mr. Alfred A. Flinn; director, Mr. George B. Francis.

—Hon. J. A. Johnson, Mayor of Fargo, N. D., has been defeated for re-election by Mr. W. D. Sweet. Mayor Johnson, however, says that no one feels better than he over the result as he has been Mayor for eight years and has done all the work and received all the abuse any man should have.

—Mayor Byrne, of Spokane, Wash., was the recipient recently of a threatening letter which stated that his home would be blown up if he did not change his political actions. Previous to this somebody exploded two sticks of dynamite in front of his house, shattering the windows but fortunately harming no one.

—Elections in Iowa cities resulted in the election of the following to the offices of mayor: Council Bluffs, Mr. Dell G. Morgan, Republican; Des Moines, Mr. James M. Brenton, Republican; Onawa, Mr. William C. Brown; Sioux City, Mr. E. W. Caldwell, Republican; Burlington, Mr. H. C. Marquardt, Democrat.

—Elections for mayor in Ohio cities resulted as follows: Dayton, Mr. Charles A. Snyder, Democrat; Conneaut, Mr. Ellison J. Harrish, Democrat; East Liverpool, Mr. W. C. Davidson; Hamilton, Hon. C. S. Bosch, Democrat, re-elected for the fifth time; Youngstown, Hon. Frank L. Brown, Republican, re-elected.

—The Trenton, (N. J.) *Times* has been publishing a series of exclusive articles by Mr. Kendrick C. Hill, president of the Common Council of that city, under the general caption, "Municipal Housekeeping." The *Times* has been publishing other articles by the city officials on municipal matters that are of great interest to municipal students.

—Mayor T. W. Hugo, of Duluth, Minn., designated April 19th as the day for a general cleaning of premises by every householder. All citizens were appealed to to undertake this work. Last year neighborhood cleaning parties were organized to make a general spring cleaning of yards and it is probable that there will be many more this year.

—The first message of Mayor Hardwick, of Erie, Pa., calls for the establishment of a board of works, an increased police force and better water. Septic tanks and filter beds should be installed for disposing of the sewage and keeping it out of the bay. The Mayor is in favor of a municipal paving and electric light plant and better street cleaning.

—The opponents of the three-cent fare in Cleveland, O., have obtained a temporary injunction restraining Mayor Tom L. Johnson, the Board of Control, etc., from beginning the work on the proposed three-cent-fare railway. It was declared that the ordinance granting the franchise for the road was illegal and an abuse of the corporate powers of the city.

—Mayor S. M. Hoyer, of Altoona, Pa., the newly elected head of that city, suggests to the Council in his first message that the unpaved streets intersecting paved avenues be paved for a distance of about fifty feet, as the mud carried by teams from the unpaved streets, would be largely shaken off in that distance and the labor of cleaning streets would be materially diminished.

—Mayor Parker, of Topeka, Kan., received a horsewhipping at the hands of one of Carrie Nation's saloon-smashing brigade. The Mayor had not closed up the saloons and "joints" quickly enough for these fanatics, and so it was intended to chastise not only the Mayor but all the city officials and the Governor of the State. Only one woman had the nerve to carry out her part of the programme.

—The City Council of Camden, N. J., has deprived Mayor Nowray of power to remove any member of the police department. The Mayor has contended for some time that he is vested with this power of removal, but an ordinance providing that the Police Commissioners shall try every accused member and report to the Council was recently passed. This ordinance, however, does not remove the Mayor's power of appointing to vacancies.

—Commissioner of Public Works Moreland of Detroit, Mich., declares that shark-fishing is more exciting than local politics, and, as in politics, it requires a strong pull to land the game. During a recent trip to Palm Beach and other resorts in the South, Mr. Moreland succeeded in landing a large hammer-head shark, weighing about 1,000 pounds. The Commissioner likens these sharks to the "White Wings" brigade in that they are liable to clean up everything offensive in sight.

—In his annual report Mayor Hugo of Duluth, Minn., recommends that all electric wires be placed underground because of the danger that the overhead wires threaten and because citizens have a right to the best possible service of corporations that use public property. Among other things suggested are the acquisition of play grounds and parks, a pension system for the old city employees, a good fire fighting tug, the municipal inspection of all plumbing and supervision of billboard advertising.

—Still another "labor mayor" has been added to the list. Hartford, Conn., has elected the candidate of the Economic League for Mayor, Mr. Ignatius T. Sullivan. The League is an association composed of organized labor and has proved itself strong enough to dominate the Democratic party in Hartford. Mr. Sullivan is a native of Canton, Mass., and has resided in Hartford about seven years. He has been a clerk in a clothing store and has been president of the Retail Clerks' Association, a branch of the Central Labor Union. He is now serving his second term as president of the State Federation of Labor.

CONVENTION DATES

MAY

The eighth annual meeting of the National Municipal League will be held at Boston, Mass., May 7-9. Clinton Rogers Woodruff, Secretary, 703 North American Building, Philadelphia, Pa.

The Chiefs of Police Association of the United States will meet at Louisville, Ky., on May 7. Major Richard Sylvester, President, Washington, D. C.

The Territorial Firemen's Association will meet at Oklahoma City, Ok. Ter., on May 8-10. C. Bible, President, El Reno, Okla.

Alabama League of Municipalities will hold its annual convention at Montgomery, May 8-10. Hon. W. M. Drennen, Birmingham.

The convention of the National Electric Light Association will be held at Cincinnati, O., on May 20-22.

The American Civil Engineers' Society will meet at Washington, D. C., May 20-27. Charles Warren Hunt, New York City.

The American Society of Mechanical Engineers will assemble at Boston, Mass., May 27.

Charities and Correction National Conference will be held at Detroit, Mich., May 28 to June 3. Jas. B. Byers, Columbus, O.

JUNE

The American Water Works Association will hold the twenty-second annual convention at Chicago, Ill., June 10. Peter Milne, 99 Nassau street, New York City.

The American Institution of Electrical Engineers will meet at Great Barrington, Mass., June 24-27.

AUGUST

The tournament of the Illinois Firemen's Association will be held at Blue Island, Ill., August 5-7. Walter E. Price, Champaign, Ill.

The League of American Municipalities will hold the annual convention at Grand Rapids, Mich., August 27-29. Hon. John MacVicar, secretary, Des Moines, Iowa.

SEPTEMBER

The Association of Chiefs of Police of the Pacific Slope will meet at Portland, Ore., September 16. Chief Hodgkins, Oakland, Cal.

OCTOBER

The annual convention of the American Society of Municipal Improvement will be held on October 7-10 at Rochester, N. Y. E. A. Fisher, President, Rochester, N. Y.

BRIDGEPORT'S STOKER MAYOR

MAYOR MULVIHILL *

THE elevation of a stoker in one of the large manufactories of Bridgeport, Conn., to the office of Mayor of that busy city caused not a little stir in political and other circles throughout the country. Newspapers sent representatives post haste to interview Denis Mulvihill, this new Mayor, and much was written about him. Outside of his own city, however, he has proved a nine-days' wonder, but when the uniqueness had worn oft and Mayor Mulvihill had time to show what he was going to do in his new position, a representative of the MUNICIPAL JOURNAL AND ENGINEER visited Bridgeport for the purpose of judging what sort of man Denis Mulvihill is. There are apparent several traits of character which seem contradictory and yet, if the man's past life be used to interpret, the contradiction lessens.

Mayor Mulvihill was born in Ireland fifty-six years ago last July and thirty-two of these he has spent in Bridgeport and for twenty-five years has been a stoker of the Wheeler & Wilson Company. That he is thrifty is shown by the fact that he was able to save, out of his modest wages of $12 a week, enough money to rear a family, buy property and build houses, and this thrift has shaped his political career. In some cases this has been carried too far, in the endeavor to save the penny he has lost the pound.

Denis Mulvihill cannot see that there are many things for which money is expended which are not tangible but which, nevertheless, are as important as any. For these things he has no use. To illustrate The present city hall, from all appearances, was built in the year one and time has not used it gently. It is far too small for the needs of the city; the roof leaks; the floor and trim are worn and old; the walls cracked and discolored and the whole building as dark and dingy as an old prison. It was planned by the former administration to replace this old relic by a modern structure in keeping with the surrounding office buildings. Plans were made for a building to cost $350,000 complete, but the election took place before they could be carried out and the new administration immediately put a stop to the work. To satisfy the popular demand for a better city hall, the Mayor and associates planned to spend $70,000 in patching up the old building, putting on a new roof and generally covering up its defects, but the friends of the new building got an injunction and there the matter stands. The Mayor seems to think that as the walls of the present structure are about three feet thick, and so liable to stand up for a time, there is no need to beautify the city with a decent municipal building. The element of beauty is not tangible in the mind of the Mayor and so of no value.

The same idea is illustrated by his steady opposition towards having the city represented in the League of American Municipalities. This has been accomplished despite his wishes. The knowledge of municipal affairs which the officials would acquire from mixing with officials from other cities and which would enable them to govern their city better, never appealed to Mayor Mulvihill. The return for the money could not be measured in dollars and cents and so was valueless. "No junketing trips," says the Mayor, but when it was suggested that he himself attend this year's meeting of the League and so remove all possibility of "junket" from the trip, the small expense still outweighed the gain that would accrue. It is to be hoped that the Mayor will change his mind before summer.

Mayor Mulvihill's five years as alderman were devoted to keeping down expenses and needless waste of the public finances. Whenever money was to be appropriated Mulvihill always "wanted to know" about the purpose of it and much extravagance was prevented through his efforts. Since his elevation to the office of Mayor he has continued on these lines. Thus the abolition of the offices of fire marshall and inspector of streets saved considerable expense to the city and did away with apparently useless offices inasmuch as others could perform the duties, but the veto of a new city hall, which would be an honor to the city, is an illustration of the extreme to which his policy can be carried. He has not yet come to realize that the best, most healthy and therefore the cheapest method of garbage disposal is the erection of a city crematory. He still holds to the antiquated city farm and its pigs.

The Mayor is not a believer in municipal ownership for the reason that politics enter into it and defeat its purpose. The Mayor draws his objections in general from the experience that Bridgeport is having with her rock crusher. It must be admitted that there are many instances that corroborate the Mayor's objection, but there are some public utilities, such as water works, wherein the success of many cities has demonstrated the practicability of city ownership.

Mayor Mulvihill is shrewd, he is honest and is trying to do the best he can for his city and some of his fellow officials could pattern after him with profit to the city. With a greater knowledge of municipal affairs and a broader financial policy, he would make a mayor of whom any city could be proud. His failures will be mostly negative, but he has some good advisers outside of his party who are no doubt greatly aiding him in his work.

* Photograph, courtesy *Leslie's Weekly*.

SELF GOVERNMENT FOR IOWA CITIES

THE Supreme Court of Iowa has handed down a decision stating in the most emphatic terms that local self-government is the basic principle of municipal government in that State. The case is the Sioux City water works case. A State law empowered the judges of the district courts to appoint trustees who should have absolute control of the water plants in cities of the first class. A taxpayer of Sioux City began this suit to test the validity of the law. The questions of law were: The constitutional power of the Legislature to take away the control of the works from the City Council; presuming that the Legislature has this power, are the acts of the Legislature unconstitutional because of the manner of the execution of the power? Had the said taxpayer enough interest in the question to enable the Court to render a decision upon the merits? The Court decided the last point in the affirmative.

Under the American form of government the legislature creates municipalities and defines their powers. As to the matters relating to the performance by the city of functions as an agent of the State, the legislature's power is unlimited, but the city may hold and manage property of its own without interference by the legislature. An Iowa court had already held that the legislature could not delegate the power of municipal taxation to a board not elected by the people affected. This brings in the primary division of the powers of government—legislative, executive and judicial. It is the foundation of the system of government, and the Iowa Constitution provides that no one exercising powers in one of these branches can exercise any function belonging to another. If the legislature could select these trustees, it could likewise appoint all municipal officers. The district, being established by the constitution, can wield only constitutional powers. The appointment of trustees to manage water works belonging to a municipality is surely not a judicial function. In advance of some dispute concerning the management of these works, courts have nothing to do with them. If courts may select municipal officials they can also select county and even state officers and such a union of power would be tyranny.

The three co-ordinate parts of the government should be preserved throughout. Municipal reforms must come from within and not from without and good government can be secured only by the active co-operation of all good citizens. The tax-paying classes, who suffer most under mismanagement, have the remedy in their own hands. It is not by placing all municipal affairs in the hands of the judiciary, but by taking the same interest in the administration of local affairs that they do in their own private business.

CURRENT NEWS AND PRACTICE AMONG THE CITIES

Indiana City Votes to Own and Operate Telephone System—Salvation Army to Clean Streets of Duluth—Long Distance Heating in Germany—First Municipal Trade School

COMPANY TO PAY RENTAL FOR SIDEWALK.—Jersey City, N. J., is to receive a yearly rental of $1,000 from the Merchant's Refrigerating Company for permission to construct a platform on the sidewalk in front of the company's property. The platform is to facilitate the loading of trucks. In addition to the rental, the company is to pave the street in front of its building without charge to the city.

CAMPAIGN AGAINST BILLBOARDS.—The people of Portland, Ore., are conducting a compaign against the unsightly billboards that disfigure all parts of the city. A measure has been introduced in the City Council for abating the nuisance. Members of art clubs and of the Improvement Society have taken up the question and are making strong arguments against the further continuance of this evil. Should the pending measure pass bicycle racks will also have to go.

NO SWINGING SIGNS FOR TRENTON.—An ordinance has been passed by the common council of Trenton, N. J., prohibiting the erection of any stationary or swinging sign, any stationary awning shed or similar construction across any part of any sidewalk in the business portion of the city. The police department are to see that the ordinance is carried out and after three months all such obstructions are to be removed at the expense of the owner if not previously removed.

CITY OWNERSHIP OF TELEPHONES.—It is reported that the city of Evansville, Ind., has voted to put in a telephone system to be run by the city. As the franchise of the present telephone company will expire this summer, four companies made application for the franchise. There was so much competition and trouble that the council decided to establish a system to be under municipal ownership. The experiment, if successful, will encourage many other cities who are in the control of telephone companies which have a monopoly of the business.

CHICAGO WANTS MUNICIPAL OWNERSHIP.—At the recent aldermanic elections in Chicago the people had a chance to express their opinion on the municipal ownership of public utilities. There were 124,594 votes in favor and 25,987 against public ownership. The people had an opportunity also to decide as to the method of nominating candidates for public office. The practice of holding ward conventions at which delegates were selected to attend general conventions was equally overwhelmingly voted down and the method favored of nominating candidates by direct vote of the people.

MUST PLACE HIS NAME IN TELEPHONE DIRECTORY.—A case that is amusing the people of Seattle was recently commenced by a cigar dealer of that city, who asked the Superior Court for a writ of mandamus to compel the issuance of a new directory of the Sunset Telephone & Telegraph Company which should contain his name and telephone number. The court granted the writ, saying that it was the duty of the telephone company to issue complete directories for the benefit of the public at reasonably regular intervals. Heretofore the company has only been putting out a new book about once a year.

GLASS STREETS FOR HOUSTON.—The experiment recently made with glass streets in Paris set some of the aldermen in Houston, Tex., to thinking seriously of introducing some of this pavement in their city. The great quantities of fine glass sand to be found at the mouth of the San Jacinto river could be delivered in Houston at about fifty cents per cubic yard, and glass for pavements could be obtained for a minimum expense. The French inventor of this pavement has a method of toughening the glass so that it is not liable to fracture easily and it is smooth, clean and impervious to water. If it is not slippery it would thus make an ideal pavement.

SALVATION ARMY TO CLEAN CITY.—Mayor Hugo, of Duluth, Minn., has made a proposition to the Salvation Army in that city to keep the streets clean. This could be done with advantage to the city and the Army, for much revenue could be derived from the sale of rags, paper and junk of the city. The branch of the Army in Chicago has been doing this work and last year 780 tons of paper, 50,000 pounds of rags, and 5,000 pounds of string were gathered up by the Army wagons. Many men were given employment in this way and the many men that come under the care of the Army and for whom work must be found, are given a chance to earn their food and lodging.

CITY TO CHARGE FOR REMOVING RUBBISH.—In order to cultivate neatness and thrift among the householders of Rochester, N. Y., Commisisoner of Public Works J. Y. McClintock has proposed to charge 10 cents a barrel for ashes which have rubbish mixed with them. Ashes without such foreign matter will be removed free. Waste paper, tree or vine clipipngs, grass, leaves, etc., are to cost 10 cents a barrel for removal. Persons who place ashes or rubbish on the streets are to be fined. These regulations were gotten up by the Commissioner in order that householders would take to burning all rubbish in their furnaces and thus make lighter the work of the city department.

TO COMBAT EXCESSIVE CAB CHARGES.—The Merchants' Association of New York has started a campaign against the illegal and excessive charges made by some of the cab drivers. Inasmuch as the statute governing the inspection of cabs imposes the great mass of detail on the Mayor personally, and which it is an impossibility for him to take proper cognizance of, the Association suggests an enlargement of the powers of the Chief of the Bureau of Licenses. Specific charges are made against such cabmen as are caught charging fares exceeding the legal rate and citizens are urged to report any such instances to the Association with the number of the cab, date and other details for identification.

STREET SPITTOONS.—A correspondent of the *Public Health Engineer* of London, England, has suggested that the city install spittoons on the streets for the convenience of those who find it necessary to expectorate. The great danger from the spread of disease because of the disgusting habit of spitting on the sidewalks has made necessary some such solution of the problem. The correspondent says that the spittoons could be placed in the base of lamp-posts, street signs or other corner fixtures with a two-inch pipe leading to the sewer. The basins could be regularly flushed by hand or automatically. This would provide a means for those who wish to keep the streets clean, but find it necessary to expectorate.

CITY SUES GAS COMPANY.—At the direction of Mayor Nelson, the Common Council of Hornellsville, N. Y., has ordered that a suit be commenced against the Hornellsville Gas Light Company because it charges rent for the use of meters to measure the gas. The company has been in the habit of requiring a deposit of from $8 to $10 before meters would be put in, notwithstanding the fact that a state statute forbids rentals of meters by a gas company under

penalty of $50 fine for each offense. While the statute allows the company to receive deposit for the meters equal to a reasonable gas bill for two months, many of the residents of this city have been required to pay a yearly rental for the meters contrary to the express provisions of the statute.

FIRST MUNICIPAL TRADE SCHOOL.—The city of Springfield, Mass., is the first to establish a municipal trade school. Since its start in October, 1899, it has been a success and now has an enrollment of 275 pupils. The curriculum embraces nearly every mechanical trade and profession and the per capita cost of running the school last year amounted to $12.36. While no tuition is charged, each scholar in the tool-making, wood-work and plumbing classes must pay a fee of $5 to cover breakage. The tools made are the property of the city and are used in machine shops of the high school. The school uses the equipment of the shops in the manual training high school in the evening and much is saved in this way in cost of running.—*New York Sun.*

LONG DISTANCE HEATING IN GERMANY.—At Dresden there has just been completed the largest long distance heating plant in Europe. From a central station many public buildings, including the theatre, museum, the royal kitchen, etc., are heated, the greatest distance for which this heat is transmitted being three-quarters of a mile. The total heat consumed per hour is 15,200,000 heat units, and the usual steam pressure is thirty pounds. Fourteen boilers are in service, and to guard against accidents two main lines of pipes have been provided. It is found that the total loss of heat in transmission varies from four to four and one-half per cent. The pipes are protected by two layers of tin, the inner layer being perforated and the outer one covered with silk. The largest pipes have a diameter of eight and one-half inches.

OVERHEAD WIRES TO BE BURIED.—Commissioner Dougherty of the Department of Water, Gas and Electricity of New York, has formulated a plan by which all companies maintaining overhead electric wires will be compelled to place them under ground. It is part of the plan to have this work done gradually so as not to entail too large an expense on the companies at one time. The danger to life and property caused by these overhead wires has moved the Canadian Fire Underwriters' Association and the Board of Trade of Montreal to call upon the City Council to act in the matter at once. It was unanimously agreed in the Council to have the city take control of all wires, to regulate the voltage, to have all wires placed underground as soon as possible and to have all trolley wires properly protected by guards.

FOR THE CONTROL OF STREETS.—The union of Canadian Municipalities has sent a memorial to the Governor-General of Canada, in which it says that it is an association of cities, towns and other municipalities to the number of about seventy, and that it has found that all over Canada grave infringements of the corporate rights of citizens, especially as to streets, have been introduced through private bills in the legislatures; that municipalities should have full and exclusive control of their streets, and that no legislation should be passed which infringes such control without the consent of the municipality concerned. Furthermore this union is resolved to resist any such future invasion. The union also prays that legislation be passed providing for municipal control of all future works undertaken by corporations in, upon, and under the streets of municipalities.

WASHINGTON, THE BEAUTIFUL.—The Park Commission that has been planning the improvements in Washington, D. C., has about completed its plans and recently held an exhibit to show what had been done. Clay models, maps, diagrams, photographs, etc., constituted the exhibit, showing the main features of the proposed improvements. Among the many alterations Potomac Park and other parks in and about the city will be completed, the Mall will be extended and beautified, there will be a driveway from the Capitol to the river opposite Arlington, the entire length of both the north and south driveways being set aside for government and municipal buildings and all the buildings between the Mall and Pennsylvania avenue are to be removed and the railroad tracks crossing the Mall will be removed. The plans of the commission are merely the enlarged plans of Washington and L'Enfant, who founded the city.

FIRST PUBLIC WASH HOUSE IN PITTSBURGH.—Pittsburgh, Pa., is soon to have one of the first public wash houses in the United States. This will be for the benefit of poor women who make a living at washing. This idea is a common one in England, but is unique in the line of charitable work in America. Under this system women may take their washing and their children to the house where the attendants take charge of the latter while the women are at work. For a while a small fee will be charged for the use of the tubs, but it is calculated that the house will be self-supporting at the end of three years. The bath house will be thoroughly fitted out with all the modern conveniences and will afford the best sanitary conditions for work such as the women could not obtain in their crowded rooms. In connection with the laundry will be reading rooms and club rooms for the men.

JERSEY CITY WATER CONTRACT.—At last the Jersey City, N. J., water question is settled. The contract has been signed by Contractor P. H. Flynn, the Jersey City Water Supply Company and the East Jersey Water Company, and Mayor Mark M. Fagan, of Jersey City. The contract provides that work must be completed by December 25th, 1903; that for every day after that time the work is not completed, Contractor Flynn will have to pay the city $500; and if the water is not turned on by March 1st, 1904, the East Jersey Water Company and the Jersey City Water Supply Company will have to furnish the city for three years at least with water at $353,800 per year, which is the amount of interest at 4 per cent. on the $7,595,000 bond issue. This is cheaper than the present rate of $35 per million gallons. Furthermore as a guarantee of good faith, Mr. Flynn and the Jersey City Water Supply Company have agreed to deed the Longwood Valley property to the city.

DEFECTIVE SIDEWALKS EXPENSIVE LUXURIES.—The lack of reasonably safe sidewalks and streets in many northwestern cities is costing those municipalities dear. Within the past few months juries have given big damages to parties who were injured by defective thoroughfares. At Olympia a few days ago a verdict for $8,040 was given a young lady who fell through a hole in the Maple Park sidewalk and received injuries of a permanent character. At Spokane, Wash., a woman was hurt in a runaway accident. While the horse was running the carriage was overturned by reason of the street car rails being above grade. She was awarded $10,000 damages, and the Supreme Court of Washington has just affirmed the award. In Tacoma, Wash., a woman was given $800 because her husband walked off the end of a high and unguarded sidewalk and was killed. These judgments, and the pendency of many similar suits in other cities, have aroused the municipal governments to the neglected condition of their thoroughfares and are having a salutary effect in compelling needed improvements.

WANTS FRANCHISE TO PLACE STREET SIGNS.—A proposal has been made by an advertising concern to the City Council of Spokane, Wash., asking that it be granted a franchise to put up signs on the street corners on which the names of the streets are to be placed, and incidentally beneath these some advertising matter. This proposal has aroused vigorous objection from the Grocers' Association and other business men, as well as from the press of that city. The Grocers' Association says that, if the franchise be granted, a business man could be held up by the agent, who could

threaten to place the advertisement of a competitor on his corner unless a round sum was paid for the space, or else by having obnoxious signs placed there. It further asserts that such signs, having a commercial purpose, would be cheap and unsightly looking and not commensurate with the dignity of the city. While realizing the necessity of having street signs, especially in the outlying districts, it asks that the city undertake the work and that the franchise sought be refused.

COUNCIL FIXES PRICE OF GAS.—The Spokane Falls Gas Light Company is asking the Council of Spokane, Wash., for a new franchise. Some months ago a franchise was sought, but no agreement could be reached regarding the maximum rate to be charged and the measure was defeated after a lively contest. The maximum rate which the company desired to have the privilege of asking was $2.50, while the Council at that time would not concede it a greater rate than $1.80. This time the new franchise has a $2 maximum rate clause, a provision which some of the councilmen think is fair enough, though others still contend for the $1.80 rate. It is desired by the Council to insert a clause in the franchise requiring a seventeen-candle power pressure on all the lights. The gas people contend that this is not necessary, as it does not add to the brilliancy of the light when the Welsbach burner is used. This burner only requires that the full gauge be touched by the gas and just as soon as this is done the light, they claim, is as strong as if they maintained a heavier pressure, as the burning of extra gas does not add more light after the conditions required by the Welsbach burner are fulfilled.

POINTS OF INTEREST ABOUT GHENT.—Ghent, Belgium, has a population of 150,000, and is one of the most successful cities of its size in Europe. Its history dates back more than a thousand years. It is a railroad center with large manufacturing interests. there are excellent schools of all kinds including a university. Its debt has been reduced to $12,000,000. The city carries its own insurance on all public properties by funds invested in Belgian National Securities. It has invested endowment funds to repair and maintain old houses, etc., of historic interest. Also, to maintain museums and other means of encouraging painting and sculpture. All old city employees, widows and minor orphans up to sixteen years old of the employees who have died, receive reasonable pensions. The funds for this are provided from several sources: first, an invested endowment; second, from 1 per cent. of all salaries paid during service; third, from fines and various small sources. Lodging houses for indigent persons to sleep and obtain food for one or more nights are maintained separately from the police department. During the year 1900, about 3,600 persons were thus helped, of whom 597 were from other countries, two being from America. The same establishments exist separately for women.

TO PROSECUTE FOR SMOKE VIOLATIONS.—Smoke Inspector Jones, of St. Louis, Mo., has been hot foot after violators of the smoke ordinance. After a warning of thirty days to those who were known violators of the law, the inspector began to collect evidence against them for use in the courts. Two inspectors were placed in the engine room of a factory to watch the conditions there while two others with a photographer remained outside and took snapshots every few minutes so as not only to prove the volume and density of the smoke, but also to see how far it carried. The Inspector cannot recommend any device for the prevention of smoke, but each firm must decide on its own method of stopping the nuisance. Kansas City has about decided on a smoke ordinance and fuel oil is recommended by many as a solution of the problem. City Engineer Charles E. Benjamin, of Cleveland, O., has succeeded in doing much toward the reduction of the smoke nuisance in his city without recourse to the courts. The exact conditions at each plant were ascertained and then a proposition looking toward the remedy was presented in a businesslike way to the owners. It was demonstrated by example and experiment that it pays to have smokeless furnaces and the result has been that many automatic devices for preventing smoke have been introduced and 90 per cent. of the smoke prevented. At the University of Chicago a plant has been installed that bids fair to have solved the smoke problem. It is the idea of Austin D. Houghton, private consulting engineer to John D. Rockefeller, and consists in supplying hot air to the furnaces. The introduction of air has been tried many times, but it has always been cold. Under the boilers are built tunnels opening into one another and the first into the fire chamber. After the fire has been started the air in the chambers becomes warm and rises through the fire chamber where it is in condition to give up its oxygen at once. As no other air can get into the fire, under-fed automatic stokers being used to supply the fuel, there is no chance for the fire to be chilled and so no smoke can form. The Board of Health of the Borough of Queens, New York City, has been trying to force manufacturers to prevent the smoke nuisance. The vice-president of the New York & Queens County Electric Railway was recently arrested and convicted of allowing smoke to issue from his power house.

PROFITS IN ENGLISH MUNICIPAL PLANTS

THE municipal ownership of public utilities has as many friends, it would seem, as enemies, and no end of matter is written for and against its virtues. The whole question centers on whether or not it pays for the municipalities to take charge of plants necessary to the comfort and needs of the community. The following table, compiled by Mr. J. Carter, Borough Treasurer of Preston, Lancashire, England, shows how the profits of running municipal plants in English cities are applied to the reduction of the tax rates. This would seem to speak very favorably for municipal ownership.

Town.	Rates. s.	d.	Municipal profits. £	Amount in the £ by which rates reduced. s.	d.
Accrington	6	4	727	0	1.17
Ashton-under-Lyne	6	3½	3,972	0	6
Barrow	4	8	9,350	0	10
Belfast	5	9	12,800	0	3
Brighouse	7	8	—	—	
Birkenhead	5	2½	8,430	0	4
Blackburn	4	4	3,628	0	2
Bootle	5	7	—	—	
Bradford	7	2	25,164	0	4.68
Burton	7	3	7,100	0	6¾
Burnley	6	2	8,730	0	6¾
Bury	6	3	2,000	0	2¼
Carlisle	5	0	9,938	1	1
Chester	5	0	3,799	0	4½
Darlington	5	1	14,250	1	8¾
Darwen	6	8	1,000	0	1.96
Derby	5	9	17,000	0	9
Dewsbury	7	11	3,500	0	7
Gateshead	6	4	—	—	
Halifax	7	6	4,662	0	2¾
Huddersfield	7	1	3,456	0	2
Hull	7	4½	64,138	1	3½
Lancaster	3	10	7,555	0	11
Leicester	7	4	35,933	0	11
Liverpool	6	9⅛	104,323	0	8
Macclesfield	7	2	5,171	1	2½
Manchester	7	2 1-5	85,000	0	6 5-10
Middlesbrough	8	1	442	0	9 3-10
Nottingham	7	8	50,839	1	2
Oldham	7	0	16,501	0	9 3-10
Preston	7	10	13,100	0	9
Rochdale	7	2	12,063	0	9¾
Salford	7	1	19,294	0	5¾
Sheffield	8	4⅞	10,000	0	1⅝
Stafford	7	6	4,336	1	3 4-5
Stockport	5	5	10,011	0	8.7
Stockton	6	6	4,960	0	6
Southport	4	2	11,581	0	8½
South Shields	5	11	1,250	0	1
St. Helens	4	10	3,800	0	3
Warrington	6	6	5,568	0	7
West Hartlepool	6	6	830	0	0.922
Wigan	6	0	15,040	1	7¾
Wolverhampton	8	0	4,178	0	3¼
Widnes	5	10	1,608	0	3 1-5

HOW TO EXTERMINATE THE SAN JOSE SCALE

THE ravages that the San Jose scale makes among the shrubs and trees in the parks of New England caused Mr. G. A. Parker, the secretary of the New England Association of Park Superintendents, to send out a circular letter to all members of the association requesting their experiences with the pest and the means they adopted for its eradication. The answers showed that there were many that had not been visited by the parasite and the experiences of others that had had trouble from the scale were incorporated in one of the bulletins sent out by the secretary, at regular intervals, and containing valuable information on topics of interest to the members of the organization.

The scale attacked many of the kinds of trees usually found in parks and also fruit trees. It was stated by Mr. A. P. Capen, the superintendent of the parks of Holyoke, Mass., that unless some rigid measures were adopted, the fruit interests in the New England states would become extinct in a few years. Great trouble arises from the fact that the owners of trees were not interested in the extermination of the pest and so the trees of the parks were constantly being infected from the trees outside.

The consensus of opinion was that the best means of treating the scale lay in spraying the trees thoroughly with kerosene, whale oil soap, as recommended by L. O. Howard, of the United States Department of Agriculture in a pamphlet entitled, "Some Scale Insects of the Orchard," by scraping off all loose bark, by introducing on the plants lady bugs which will eat the scales, or by burning the whole planting. Whale oil soap, kerosene and water make a good mixture to spray on the trees. Spraying the trees was found the best means of applying the wash and this should be done several times. The winter months were the best for the work as the plants were not so sensitive, but some work also should be done in the summer. Forester Robert Karlstrom of the Department of Parks of Hartford, Conn., describes the methods of fumigating the young plants employed in his city. A large wooden box is erected and made air tight with heavy paper. Openings are made in the bottom and top, in the lower one of which are placed the chemicals which, for a box containing 570 cubic feet, are four and one-half ounces of potassium cyanide, seven ounces of sulphuric acid, grade 184, and eleven ounces of water. Put the acid in a glazed vessel, add the water carefully, stirring well, then place the vessel in the box. Put the cyanide, bag and all, in the mixture of acid and water and close the box. In about six hours the box may be opened and the plants removed, but be careful not to breathe when in the vicinity of the box as the fumes are very poisonous. This manner of fumigating is cheap and sure to kill the insects.

It is evident that radical measures are necessary whenever the San Jose scale appears, as it will cover a tree completely in a season and in two or three seasons at the utmost will have entirely killed it.

SOME INTERESTING FACTS ABOUT DRESDEN

DRESDEN, like many other German cities, owns and operates its gas, electric light and water plants. These have been successfully carried on for many years and have demonstrated the feasibility and profit of municipal operation of public utilities. Last year 1,094,796,000 cubic feet of gas were produced by the gas plant used for illuminating purposes, cooking, heating and power. The loss in leakage it was estimated amounted to 3.8 per cent. The net earnings of the plant were $443,442, which was applied to the reduction of the city taxes. The by-products were ammonia, tar and coke, which had an aggregate value of $272,700. About 12,000 short tons of coal were consumed, costing $4.60 per ton delivered. One ton of coal produced 9,530 cubic feet of gas.

The Electric Light Plant has engines aggregating 5,200 horse power, and a capacity for turning out 3,580 kilo-watts. This current maintains 97,132 standard lights and a certain amount of power. The plant is being increased in size this year. The total receipts for lighting, etc., amounted to $230,000; the total expenditures, $184,000, including sinking fund and interest.

There are ninety miles of street electric cables. The city furnishes the current to the street car companies for oprating the electric trolley system, the receipts for which amounted to $163,000 last year, upon which the city netted $33,000.

During the past year the Water Works have been enlarged. The total consumption for the year amounted to 3,103,815,000 gallons. The per capita consumption per day amounted to about twenty-five gallons. The total receipts of the plant for the year were $425,000; total disbursements, $400,400, including maintenance, extensions and expenditures. The aggregate profit to the city on these public utilities for the past year amounted to $447,042. This profit, when it is considered in connection with the low prices at which the various products are sold to the consumer, is large, in comparison with the results obtained in American cities of the same size.

HOW TO ABATE THE SMOKE NUISANCE

LIKE many other cities in the country, Louisville, Ky., is wrestling with the smoke nuisance. Whether heavy black smoke in the air is a direct menace to health has not been absolutely ascertained, but it is a fact that the presence of smoke is indirectly responsible for bad health of a community. A smoky atmosphere shuts out the blue rays of the sun which are essential to the growth of both plants and animals. Smoke, too, has a demoralizing effect on the people, for it makes almost impossible personal neatness and cleanliness of houses inside and out. It has been proven that this excess of smoke is entirely unnecessary if the proper precautions are taken. If every furnace had a smoke consumer, or more properly a smoke preventer, or if the fires were rightly stoked either by skilled firemen or automatic stokers, 90 per cent. of the smoke in the atmosphere would not exist.

The Commercial Club of Louisville has taken up the matter of smoke consumers and is endeavoring to have the manufacturing concerns in that city put in some device to do away with the smoke. Many firms claim that a perfect consumer is not to be had and that the compulsory use of them will drive the companies out of business on account of the cost. Those firms that have already adopted good consumers testify that not only are they efficacious in preventing smoke, but afford a saving of fuel from 10 to 25 per cent. The Louisville City Railway Company has consumers in operation and in their boilers two and one-half pounds of coal produced one horse-power per hour. One of the large hotels was saving two and three-quarter cents a bushel on its coal on account of the use of a consumer. In four years the Y. M. C. A. paid for its dynamo, stoker and electric lights out of the saving of fuel due to the stoker. Other concerns gave similar testimony to the club.

At the request of the club, Prof. E. H. Mark, superintendent of the Louisville Public Schools, wrote a short paper on the subject of consumers. He said that the elimination of smoke is a question not only of luxury but also of economy. From seven years' experience in the use of stokers in a plant the following figures were obtained. The plant in question has in operation three 150 horse-power and two 100 horse-power boilers. Four are equipped with stokers of one pattern and one with that of another make. The total cost of the furnaces was $3,614.55. The interest on the investment for the seven years and some months at 6 per cent. amounted to $974.61. The repairs aggregated $1,040.90, making the total cost $5,630.06. At an average price of $1.17 per ton of coal, the 22,336 tons consumed in the plant cost $26,168.22. It would have cost $42,663.07 if the furnaces had been fired by hand using lump coal at $1.75 as shown by the actual test of 24,379 tons, or, using the run of the mine at $1.50 per ton, it would have cost $36,568.35. Deducting the actual cost of coal from this the saving in coal amounted to $10,400.13. After deducting from this the cost of furnaces, interest and repairs, the saving over all was $4,770.07. The automatic stokers rendered necessary the services of only one fireman. The amount saved in a year amounted to 6 per cent on the investment.

Smoke consumer ordinances are in effect in other cities, notably Cincinnati, St. Louis and Cleveland, and the results are very encouraging to the city officials. The authorities at the World's Fair to be held at St. Louis in 1903 have stated that there will be established a smokeless city on their grounds. When once the people of a city are convinced that smoke can be prevented and appreciate the joys of a smokeless atmosphere and when the manufacturers are made to see the economy in the use of consumers of whatever design or make, then 90 per cent. of the smoke will be banished from the air and cities like Pittsburg and London be made "a joy forever" as far as clear and pure air can do so.

SEWAGE DISPOSAL AT BROCKTON

THE method of disposal in use at Brockton, Mass., is not what would be strictly known as irrigation, but rather intermittent filtration, the area being specially prepared for handling the sewage. The same natural reactions which affect its purification, however, apply in irrigation and the only difference is in the amount of sewage which can be disposed of per acre.

Brockton is a city of some fifty thousand people. The amount of sewage daily varies from 600,000 to 1,000,000 gallons, but is specially strong because of the low water consumption, and is practically equal in contained organic matter to 3,000,000 gallons of ordinary sewage. The disposal field is thirty-six acres in area. It is divided into beds of one acre each, the surface being perfectly level, and the sewage flows out on to the surface from pipes which are laid in the embankments dividing the beds. The sewage is pumped from the city through twenty-four-inch pipe three miles long, the time of pumping being limited to the day hours, and the night flow being stored in a reservoir. The sewage is applied to one bed for about twenty minutes, the dose in this time equaling 100,000 gallons. It is then turned on to another bed, and so on until the entire daily quantity is handled. The capacity of the disposal field per acre in purifying sewage is in the neighborhood of 100,000 gallons per acre per day. The purification effected is extremely high, the effluent being by actual chemical analysis better than many drinking waters.

As already stated, the pumps are only run for a short time during each day, and a large part of the solid matter of the sewage settles in the reservoir. This is subsequently churned up, automatically, pumped to the disposal area and applied to particular beds. Once in sixty days, the bed is raked, and the scum which has formed, and which resembles a heavy matted roofing paper, is hauled off. By analysis made at the Massachusetts Agricultural College, this deposit is worth about $4 a ton theoretically. Experience has proved its value to the neighboring farmers and it is now sold for a number of hundred dollars each year.

In summer about half the area of the field is cultivated. In the early years of the system almost every vegetable was experimented with and in every case with success, so far as ability to raise a good crop goes. From a financial standpoint, however, owing to the fact that $2 is paid for eight hours' labor, corn is the only crop worth growing.

There is no question whatever of the fertilizing quality of sewage; no question but that the crops thereof are perfectly healthful, as at Brockton, no difficulty has been found in disposing of the produce. As to the influence of the field upon the health of the surrounding country two families have lived in the midst of the Brockton field for five years, both of them with a large number of children, and all are perfectly healthy.

SCRANTON TAXES ITS STREET RAILWAYS

ACTING under a section of the recent "ripper act" passed by the Legislature of the state of Pennsylvania, the city of Scranton has just passed an ordinance taxing her public service corporations, notably the street railway companies, which met with considerable opposition from the companies. It was introduced last fall.

The portion of the charter under which this ordinance was passed reads as follows:

"And every city of the second class shall have power for general revenue purposes to levy and collect license taxes or fees, to be fixed by ordinance, upon street railways, hack drivers, auctioneers, bill posters, public balls or dances, night soilers, garbage collectors, railroad switches, pawn brokers, peddlers; venders of any kind of merchandise whatsoever using streets, lanes, highways, wharves, or public squares or ground for the purpose of vending the same; all theatrical exhibitions, whether permanent or transient (including circuses), vehicles, bicycles, tricycles, automobiles, dogs, ball games or ball parks, and all other matters and things of a like nature, and to regulate the collection of the same and to provide penalties for default therein."

Every railway company shall pay on a license tax for the fiscal year 5 per cent. of its gross receipts per annum. Water, gas, electric light, heating and telephone companies shall pay an annual tax of 2 per cent. on the gross receipts. All taxes are due on the 1st of April and, if the tax is not paid by the 1st of June, 5 per cent. is added to the sum. If the tax still remains unpaid fifteen days later, suit is to be entered.

Shortly after the ordinance was passed, the railway companies of Scranton offered to pay a graduated tax. As only one of the four companies was in operation at the time of the passage of the ordinance, that company was taxed the regular rate, while the others were allowed to assume the graduated tax. The provisions of the graduated tax are the same for each of the three companies and provide for the following payments: For the years 1907 and 1908 1 per cent. of gross receipts; for the following three years 2 per cent. of gross receipts, and for every year thereafter 3 per cent. of gross receipts. In addition, the ordinance further states that, in event of a general tax hereafter to be legally assessed upon the corporations, the company shall pay the additional tax in excess of the tax aforesaid. In addition to the tax the ordinance specifies the kind of rail to be used, the speed of cars, the amount of paving to be done, the kind of poles to be erected, with city privileges on each pole, a system of transfers, a five-cent fare, with three-cent books to be good morning and evening, etc.

The railway company, subject to the regular tax, has rebelled and is trying to have passed a graduated tax as follows: For the year 1904 1 per cent. of gross receipts; for 1905, 1½ per cent. of gross receipts; for the year 1906, 2 per cent. of gross receipts; for the year 1907, 2½ per cent. of gross receipts; for the years 1908, 1909 and 1910, 3 per cent. of gross receipts; for the years 1911, 1912 and 1913, 3½ per cent. of gross receipts; for the years 1914, 1915 and 1916, 4 per cent. of gross receipts; for the year 1917, and for every year thereafter, 5 per cent. of gross receipts.

Under the ordinance passed the total percentage of tax levies will amount to 15 per cent, and, as the receipts of the corporations will run into the millions, the sum added to the city treasury every year will furnish a very substantial revenue.

CHARGES FOR WATER IN ENGLISH BOROUGHS

CHARGES IN THE £ FOR DOMESTIC PURPOSES ON HOUSE £15 RATABLE VALUE

	s.	d.		s.	d.
Accrington	1	0	Leicester	1	7 1-5
Ashton-under-Lyne	1	11	Liverpool	0	7½
Barrow-in-Furness *	1	0	Macclesfield	1	3
Bath	1	0	Manchester	0	8
Belfast	1	0	Middlesbrough	1	3
Birkenhead	0	10¼	Newcastle (a)	—	
Blackburn	1	7 1-5	Northampton (b)	1	3
Blackpool	1	6	Norwich	1	5¾
Bootle	0	7½	Nottingham	1	1
Bradford	1	6	Oldham	1	6
Brighouse	1	0	Portsmouth	1	3 1-5
Burnley	1	0	Plymouth	0	11
Burton-on-Trent	1	5¼	Preston	1	0
Bury	2	0	Reading	0	10 4-5
Bristol †	1	3	Rochdale	2	0
Brighton	0	9	Rotherham	1	6
Bournemouth (a)	0	10 4-5	Salford	0	10
Carlisle	1	0	Southampton	1	0
Cheltenham	1	0	Sheffield	1	3¼
Chester	1	8	Southport (a)	1	0¾
Coventry	1	2 2-5	Stafford	1	0
Croydon	1	2 3-5	Stockport	1	6
Darlington	1	3½	Stockton-on-Tees	1	4 4-5
Darwen	1	7 1-5	Sunderland	1	0
Devonport	1	2	St. Helens	1	0½
Dewsbury	1	2 2-5	South Shields	0	11 1-5
Derby	1	3	Wakefield *	1	5½
Eastbourne	1	0	Tunbridge Wells	1	2
East Ham	1	1½	Wakefield	1	5½
Gateshead	1	3 1-5	Warrington	1	2 2-5
Halifax	1	5 2-3	West Bromwich	1	2 2-5
Huddersfield	1	8	West Ham	1	2
Islington	1	0¾	West Hartlenool	1	6
King's Lynn	0	9	Wigan	1	1
Kingston-upon-Hull	1	0	Wolverhampton	1	3
Lancaster	1	4	Widnes	0	11¼
Leamington	0	8	York (a)	1	0
Leeds	1	0			

* Charge on gross rental. † Average of two levels, baths and w. c. extra. (a) Private company. (b) Average charge.

NOTE.—Compiled by Mr. James Carter, Borough Treasurer of Preston, Eng

AGAINST MUNICIPAL OWNERSHIP

In order to ascertain what it is costing other cities owning their own electric lighting plants, the council of the city of Worcester, Mass., sent out a circular letter to all the cities in Massachusetts having municipal plants in operation. It was desired to learn whether it would be profitable for the city of Worcester to take over the lighting plant from the Worcester Electric Light Company. Of plants outside the State of Massachusetts answers were received from eight of fifty cities, approached on this same subject, and the average cost per lamp hour, if they were burned on the Worcester schedule and in the city, was 3.4 cent. This was .6 cent more than that paid for Worcester street arcs, which was 2.8 cents per lamp hour.

As the municipal plants in Massachusetts are obliged by law to keep their accounts in accordance with a system adopted by the State Board of Gas and Electric Commission, and as all the companies have to keep their accounts in the same way, the comparison of the costs of the municipal and private plants is on a correct basis. The average cost of street arcs per lamp of the municipal plants in the state is 4.34 cents and with two exceptions the lamps are of 300-watt capacity. In Worcester the lamps are of 500-watts. Thus, to put them on the same level, it would cost 4.58 cents to equal the Worcester lamps. The cost of the municipal plants is largely determined by the amount of commercial lighting done and in Worcester the operation of the plant by the city would be favorable in this respect in that the commercial business done by the Worcester company's plant is much larger that that done by many municipal plants.

In Taunton the ratio is nearly equal to that in Worcester. Thus there are 227 arcs and the equivalent of 5,946 sixteen candle-power lamps, while Worcester has 700 lamps and 19,000 sixteen candle-power lamps. The Taunton plant was purchased by the city in July, 1897, at a cost of $125,000 and $26,000 has been added since. The street lights are of 1,200 candle-power and burn 3,400 hours a year at a cost of $72.96 per lamp. Burned on the Worcester basis the cost per lamp would be .05 cent more. As about $50,000 must be spent on the Taunton plant the cost will be brought up to 3 cents.

After careful inquiry the town of Brookline contracted with a local company for 500-watt lamps burning 3,900 hours per year at 35 cents per light per night. Springfield, too, after considering municipal ownership, renewed its contract. Hudson acquired the electric plant and the lamps cost three times that paid in Worcester. In Wakefield the price formerly paid under contract was $75 per light per year for 1,200 candle power lamps burning five and one-half hours a night. The city paid $164,000 for the plant in 1894. $180,000 is invested in the plant to date, 1,200 candle lamps burn six hours a night and the cost is $74.68 a lamp a year. Taking into consideration the tax per lamp paid by the corporation, the price would be increased to $86.82 per lamp.

The wording of Chap. 370, Acts of 1891, of the Laws of Massachusetts, in regard to the purchase of plants by cities, is as follows:

"And the price to be paid therefor (i. e., the existing plant), shall be its fair market value for the purposes of its use, no portion of such plant to be estimated, however, at less than its fair market value for any other purpose, including, as an element of value, the earning capacity of such plant based upon the actual earnings being derived from such use at the time of the final vote of such city or town to establish a plant and also of any locations or similar rights acquired from private persons connected therewith."

As the city solicitor could not interpret this act, the committee of the council reached the conclusion that the probable value of the plant was the market value of the company's stock at the date of vote in favor of the taking. The stock of the company was quoted at $210 a share. The company was capitalized and had no bonds outstanding. According to the committee this made the property worth $1,260,000. Adding 12 per cent. for interest, sinking fund and depreciation or $151,200 per year as the amount to be earned under municipal ownership and 25 per cent. to the present pay roll of the company in as much as the city can only work eight hours a day and the company ten, the city cannot work the plant as cheap as the company. The running expenses of the company during the last year were $124,000, to which must be added the $151,200 determined as above or a total of $275,200, which it would cost the city to run the plant. As the total business of the company last year amounted to $236,000, the business was $39,000 less than the cost of operation under municipal ownership. If the State Board follows its usual custom of charging the deficit in commercial lighting to the cost of the street lights, the cost of street lights will advance from $79,000 to $118,000, the price of arcs from $109.50 to $168 or from 2.8 cents per lamp hour to 4.95 cents. If the taxes paid by the company are taken into consideration, the sum of $8,000 must be added to the above yearly deficit. Under the foregoing conditions the committee recommend that it would not be expedient for the city to purchase the plant.

ELECTRIC LIGHT RATES

In the following tables will be found some of the rates in force in several western cities, some of which are supplied by private companies while others own their own plants. In many of the latter the profits from commercial lighting pay for the operation of the street lights.

CITIES LIGHTED BY PRIVATE COMPANIES

	Meter rate per 1,000 Watts.	Flat rate per month.	Cost arcs per year.	Cost incandescents per year.
Cherokee, Ia.....	$.20	$.75	$72	
Decorah, Ia.....	.15	.60 to $1	72	(2) $12.00
Hampton, Ia.....		.01 hr.		
Iowa City. Ia.....	.15			
Jefferson City, Mo.		.75	65	
Le Mars, Ia.....		d .80	72	16.00
Mankota, Minn.....			74	(2) 21.00
Mitchell, S. D.....	.20		96	
Ottumwa, Ia.....	.13			
Piperstone, Minn...		(1) .75	E 114	
Trenton, Mo.....		.50	90	(2) 22.50
Waterloo, Ia.....	None	.40 to .75	65	
Watertown, S. D..	.15	f 1.25	f 120	f (2) 24

d. For first lamp, 50 cents for all over six; (1), 16 c. p.; f, all night service; (2), 32 c. p.; E, moonlight schedule.

CITIES HAVING MUNICIPAL PLANTS

	Meter rate per 1,000 Watts.	Flat rate per month.	Cost for city arc per year.	Cost incandescents per year.
Alta, Ia.....	None	b $.50		
Ames, Ia.....	‡$.150		¶	¶
Austen, Minn.....	* .125		$60	
‖Eldon, Ia.....	None	(1).35		
Tremont, Neb.....	.100	† .50	50	
Galena, Ill.....			40	
Galesburg, Ill.....	.200		48	
Hastings, Neb.....	.06 to .20	1.00		
Independence, Ia.....	.100			$12
Indianola, Ia.....	.100	a .50	60	
Mt. Pleasant, Ia.....	.100	.50	c 50	24
Rock Rapids, Ia.....	.100			
Wayne, Neb.....	.100	(1).50		

*Incandescent; (1), 16 c. p.; †, first lamp, 45 cents for additional lamp; ‡, 25 per cent. discount to large consumers; ¶, $1,825 for 50 incandescents of 50 c. p. and 18 arcs of 1,200 c. p.; a, for first ten lamps, 30 cents for rest; b, for six lamps, 15 cents for rest; c, until 12 p. m.; ‖, twenty lights cost 25 cents for 16 c. p. Good profit is made by city and this pays for street lights.

A PARK CENSUS

For several years the American Park and Outdoor Art Association has been taking a park census. The greater part of the committee work has been performed by its chairman, Mr. G. A. Parker, Superintendent of Keney Park, Hartford, Conn. The report of this committee for 1901 is of more than passing interest. It is too voluminous to print as a whole, and, therefore we can only publish a resumé.

Mr. Parker says some startling things. For instance, "Fifty years ago no municipality in the United States had purchased an acre of land for park purposes. By last year's reports, from all but eleven of the cities of over 50,000 population, there were 2,360 parks and squares enumerated, with total areas of 59,717 acres, valued at $531,571,947. The expenses for construction purposes amounted to $4,555,213, and for maintenance, $4,849,150. I have only incomplete reports for cities under 50,000 population, but it is within the realm

of probability to state that the cities of the United States have 75,000 acres of land in parks and expend $11,000,000 annually in their improvement and maintenance."

After enumerating some thirty-two heads under which information relative to the parks now existing in the United States have been connected, Mr. Parker proceeds to make some deductions from the tables endeavoring to show the area of parks as related to the area of the city, to population, to the income, and to the valuation of the real estate in the city. From these deductions he has arrived at certain conclusions.

He maintains that one-twentieth of a city's area should be reserved for parks and squares, that a playground at least three hundred feet square should be reserved to every square mile, and in densely populated sections more. Besides, there should be four other small squares reserved to the mile of at least one-half an acre each. He would proportion a thousand acres as follows: ten acres to playgrounds and squares, forty acres for large parks, one hundred acres for streets and alleys, five acres to school grounds, making one hundred and fifty-five acres for public purposes, leaving eight hundred and forty-five acres for private ownership. He states that one-third of the cities of the larger class already exceed that amount.

In determining the park acreage from the population standpoint, he asserts that there should be not less than one acre of park to every two hundred of population. "Eighteen cities," he says, "already have more than that, yet I believe the ratio will be found a satisfactory one. It fits into other calculations. The income per capita is a little over one cent a week, or sixty cents a year. On this basis the income from two hundred people amounts to one hundred and twenty dollars, which is a good average amount for maintaining an acre of park area without policing or lighting. If the cost of construction, which is conservatively estimated at two thousand dollars per acre, be included, the amount of bonds sold would be equal to ten dollars per capita."

The third element which is to be considered is the cost of construction and maintenance. Mr. Parker remarks, "It would seem at first thought, as if the man who gave the city one hundred acres for a park was doing a good thing, but he has given that which may take $200,000 to develop and $12,000 a year to maintain. There is such a thing as getting too much park." According to Mr. Parker's idea, it has not yet been determined how much land should be set aside for parks, but he asserts, "It would seem from the study which I have given the subject that one acre in twenty should be set apart for parks and squares before it is too costly, but only to be developed at the rate of one acre to two hundred of population. After many efforts to determine the cost of construction of each park as a whole, it was found impossible to form an average as a basis upon which to figure the cost of construction and maintenance of parks in different localities.

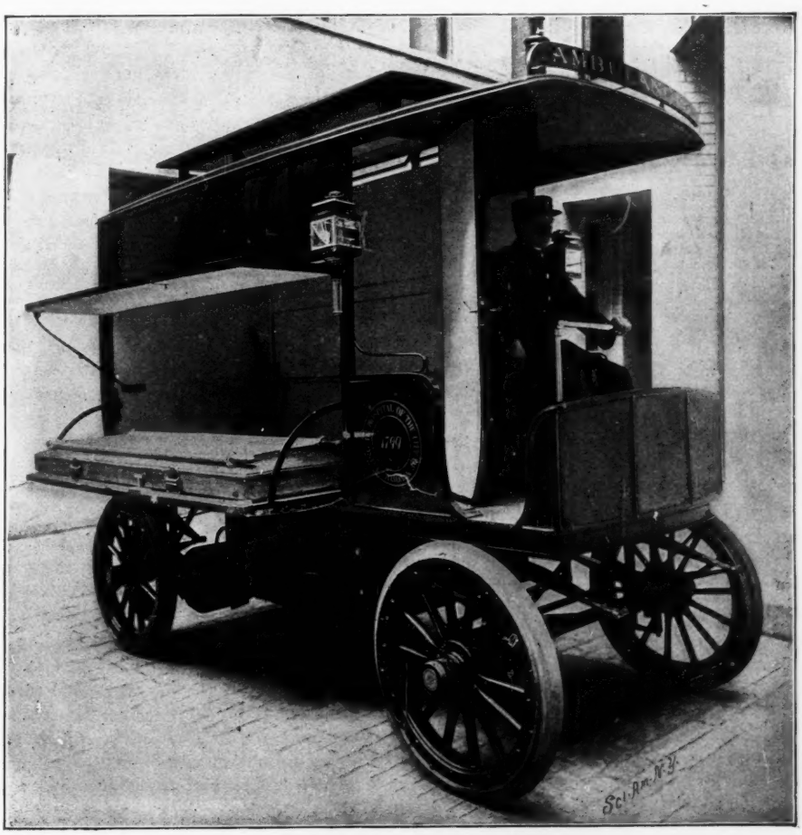
"In my study of the general subject I found one thing to be regretted, namely, that the cities made up of working people are not only deficient in park areas, but even such areas are imperfectly developed. The cities of Manchester, Scranton, Lawrence, Elizabeth, Holyoke and Fall River are types of this class. Take one city, as an illustration, whose name is not given for obvious reasons. Situated on a most delightful spot, with a population of over 100,000, the city has only about eighty acres of parks, with not an acre well developed, and only a pretense of cleanliness in a small proportion. Five thousand dollars are expended annually for park purposes in this city, and even that under politicians, so that the parks do not gain the full benefit. At least $50,000 should be expended upon this park system, meagre as it is. There are 1,200 people to one acre of the neglected park area. What is true of this city is true of many other manufacturing cities. The old Bay State (Massachusetts) may well be proud of the parks in Boston and vicinity, but she ought to hang her head in shame when she sees the provisions made for her working people."

AUTOMOBILE AMBULANCE

THE new Lying-in Hospital of the City of New York is probably the finest building of its kind in the world. Everything possible has been done to incorporate in its make-up the latest ideas of sanitation and freedom from infection. Thus there are no cracks or sharp corners in the whole building, everything being rounded off and all trim, etc., being set flush with the walls. Consequently there is no place for dust and the ever-present microbe to lodge and the rooms may be thoroughly cleaned.

In keeping with all these new ideas the hospital authorities designed the automobile ambulance shown in the accompanying illustration. They submitted their specifications to the builders, the Electric Vehicle Company, and the result has been this excellent machine.

As will be seen from the illustration, the distinctive feature of the ambulance is the method of opening it for placing the patient within. This is done by letting down and raising one each of the two side panels, when the patient, who is placed on a stretcher, can easily be slid in. This novel and convenient arrangement was devised by Dr. James W. Markoe, surgeon in chief of the hospital. The body of the ambulance is sufficiently wide to allow a passageway beside the patient for the physician, who enters through a narrow way at the front. The ambulance is lighted by small windows in the top in the day time, and by a cluster of electric lights at night. It is propelled by the usual 40-cell storage battery, and is kept in a small room specially designed for this purpose and equipped with a suitable charging board.—*Scientific American.*



THE ELECTRIC AMBULANCE OF THE LYING-IN HOSPITAL

COST OF ELECTRIC LIGHT IN SMALL TOWNS

A CIRCULAR letter sent by the Hon. John E. Jennings, Mayor of Sullivan, Ill., to the mayors of 175 towns in Illinois regarding their means of lighting, cost, etc., brought out a very generous response. In the accompanying table will be found some valuable statistics relative to electric lighting for cities and towns having a population under 10,000. Of the places heard from it was found that sixty-one obtain their light from a company and do not own their own plant. These sixty-one cities have an average of forty-six lights each and pay an average price of $70 per year per light. Thirteen cities have an all night schedule, an average of fifty-five lights per city and pay $75 a light per year. A moonlight, all night schedule obtains in thirty-six cities and the average price paid is $70 per year. Ten have a moonlight schedule to midnight and the price paid is $60 per light. Of the cities answering twenty-four own their own plants, but of these the accounts of only ten were accurate enough for definite information. Thirty-three out of the forty-three contracts in which the price is $75, or less, per year, were made within the last three years and only four of the twelve that pay over $75 were made within the last three years. All the lights reported were of 2,000 candle-power. Unless otherwise stated the prices are for a moonlight schedule, all night service.

City.	Population.	No. lights.	Price per year.
Abingtown	2,022	‡ 34	$55
Arcola	1,995	34	50
Assumption	1,702	18	72
Astoria	1,648	‡ 25	60
Athens	1,535	21	75
Beardstown	4,827	60	45
Belvidere	6,937	90	65
Bushnell	2,490	30	72
Canton	6,564	125	48
Carbondale	3,318	† 45	72
Carlinville	3,502	† 48	72
Carrolton	2,355	45	65
Champaign	9,098	† 114	65
Charleston	5,488	† 71	75
Chillicothe	1,699	32	48
Clinton	4,452	90	70
Dixon	7,917	69	80
§ Downers Grove	2,103	16	*
Dwight	2,015	30	70
Effingham	3,774	55	65
Elmwood	1,584	‡ 28	48
Flora	2,311	38	78
§ Galena	5,005	86	38
Gilman	1,441	† 26	72
Grayville	1,948	‡ 25	65
Harrisburg	2,202	† 21	90
§ Harvard	2,602	37	*
Harvey	5,395	‡ 62	60
Havana	5,395	54	72
Henry	1,637	30	90
Herrin	1,559	14	65
Highland Park	2,806	65	60
Kewanee	8,382	47	69
Knoxville	1,857	34	43
Lagrange	3,969	12	60
Lemont	2,494	‡ 35	$75
Leroy	1,629	‡ 24	48
Lewiston	2,504	‡ 48	96
Litchfield	5,918	† 65	69
§ Lockport	2,659	84	18
Marseilles	2,559	† 24	66
§ Mattoon	9,622	125	45
Maywood	4,532	38	72
Melrose Park	2,592	15	72
Monmouth	7,460	107	66
Monticello	1,982	22	72
Mound City	2,705	† 30	90
Mt. Carrol	1,965	19	96
Mt. Vernon	5,216	† 50	84
§ Naperville	2,629	16	*
Nashville	2,184	26	115
Normal	3,795	62	48
Pana	5,530	† 83	78
§ Paris	6,105	98	40
Pekin	8,420	108	65
Petersburg	2,807	‡ 46	48
Pinckneyville	2,357	25	85
Polo	1,869	40	40
Pontiac	4,266	† 36	72
Rushville	2,292	‡ 50	53
Savanna	3,325	30	84
Sullivan	2,399	40	90
Urbana	5,728	† 66	75
Venice	2,450	34	112
Virden	2,280	33	79
§ Waterloo	2,114	84	19
Wenona	1,486	23	72
§ Wheaton	2,345	52	*
§ Winnetka	1,836		*

† All night service, regardless of moonlight.
‡ Midnight service, moonlight schedule.
* Commercial lighting pays expenses.
§ Municipal plant.

ELECTROLYSIS IN ST. PAUL

ACCOMPANYING the twentieth annual report of the Board of Water Commissioners of the city of St. Paul, Minn., is the report on electrolysis in that city caused by the current escaping from the rails of the Twin City Rapid Transit Company. The investigation into the effects of electrolysis on the water pipes was started in December, 1900, and the report on the results has just been submitted.

Tests were made along forty-three miles of double and fifteen miles of single track and on the water pipes in the vicinity of these tracks. Excavations were made to determine the condition of the water pipe and the samples submitted to the expert chemist for examination showed distinct electrolytic characteristics. The chemical tests of the earth surrounding the pipes showed the presence of iron and it was plainly evident that electrolysis was destroying the pipe system. The sand and gravel pits in the vicinity of the rails and pipes were of uniform composition as regards the presence of iron and there was nothing to cause the accumulation of iron compounds about the pipes such as was found.

In the report of City Engineer Claussen he concludes that the Twin City Rapid Transit Company should be compelled to use a complete metallic circuit and provide a return circuit to the power house. Until these suggestions are carried out, matters would be materially bettered if the tracks were kept in first-class condition including the laying of large rails either welded or well bonded. The large report contains the report of the Special Committee on Electrolysis of the American Water Works Association, in which it maintained that all electric railway companies, like the electric light companies, should provide a complete metallic circuit for the return of their current. The association adopted this report at its last annual meeting in June, 1901.

Since the report has been issued the city of St. Paul has begun suit against the railway company to recover $500,000 for the damage done its pipe system by electrolysis. An injunction is also asked restraining the further use of the present system of return currents and demanding the installation of an insulated wire to carry the current back to the power house.

MODERN SEWERAGE IN MELBOURNE

THE cities of Australia are among the most progressive in the world in the line of municipal improvements. They are endeavoring at all times to adopt such schemes that the health and beauty of the city will be enhanced. The city of Melbourne is no exception to this rule and for several years it has been wrestling with the problem of proper drainage and sewerage. Like many other cities, Melbourne had acquired a large population before any attempt was made to establish a sewer system, but the system that is now nearly completed should be entirely adequate for its needs. By means of the sewer farm, on which all the sewage is deposited, a source of revenue has been established.

In 1881 a council committee called attention to the deplorable condition of the lack of sewerage and its effect on the health of the community. Then an area of 200 square miles, containing over 50,000 buildings and a quarter of a million people, had no other means of drainage than into the Yarra River. An engineer, retained by a sanitary commission to report on the best system of sewering the city, submitted his plans to the Melbourne and Metropolitan Board of Works, organized in December, 1890. Mr. William Thwaites, M. Inst. C. E., was appointed engineer-in-chief of the Board and the work on the plans was begun in 1892.

The sewers are on the separate system and are designed on a per capita basis of a daily amount of thirty cubic feet of sewage from a population of one million persons. The whole idea will furnish sewerage for nine cities, seven towns and a number of smaller places, covering an area of 103,000 acres. The first work was to make a careful survey of the ground, showing, among other things, the elevation of the lowest floor and the cellar of every house. The smaller sewers are vitrified pipes of such uniformity that they will allow a wooden dummy three-eighths of an inch less than the specified diameter of the pipe to pass through. A ring with an internal diameter one-fourth inch larger than the outside of the pipe will pass over the pipe from end to end. The pipes will sustain a pressure of a head of thirty feet of water without leaking and permit blows of a wooden hammer. In addition the pipes will sustain a cross strain of 1,000 at the centre when the supports are eighteen inches apart.

No sewer is intended to have a velocity below three feet a second and large pipes are preferred. A minimum depth of cover to the sewers of eight to ten feet has been adopted. All the sewers are laid on straight lines between the manholes with shafts for inspection at all necessary points. Flushing gates are provided at frequent intervals and where the pipe sewers join at different elevations, the manholes are so arranged that the splashing of the sewage is reduced as far as possible. The covers to the manholes are ventilated and vent columns, from thirty to eighty feet high, are also employed. At all dead ends there are placed automatic flushing syphons with tanks holding from 200 to 1,000 gallons, and these can be emptied in from two to four minutes by an automatic syphon of the Field type. In order that a vacuum may be assured in the syphon, a cellar pump is connected with water main and this pump is worked by a float, which, when the tank is full, opens the water supply valve and sets the exhauster in action. This perfects the vacuum and the contents of the tank is quickly discharged into the sewer. The syphons are so arranged that they will discharge at any interval required, which is every two hours when the number of houses are few and at longer intervals as the population increases.

Two independent pumping stations, situated side by side, take care of the sewage. Each station has a capacity of ten engines of 300 horse-power, but six engines are all that is needed at the present. One station has to pump against a head of 101 feet and the other against a head of 109. Before the sewage enters the pumping well, however, it is screened and the screening saturated with steam in a drier, with the result that it is transformed into an odorless, fibrous mass. At present only two force mains are needed to carry the sewage and these are of seventy-two and forty-eight inches in diameter respectively and, after a length of two and three-fourth miles, discharge into the outfall sewer leading to the sewage farm. The outfall sewer is semi-circular in shape, eleven feet in diameter, fifteen miles long, and has a fall of two feet to the mile. It is open except where near the main highway. It is of concrete, brick lined and at its head is a building where the sewage is deodorized, which is done by burning sulphur and forcing the gas into the sewage.

The sewage farm is 8,847 acres in extent and is used for irrigation, grazing and tree planting. The sewage from the outfall sewer is carried through the blocks into which the irrigation portion of the farm is divided in a concrete lined channel, rising gradually above the ground on an embankment. At intervals the sewage is taken off in semi-circular iron pipes, each of which supplies twenty acres of ground. The great amount of salt in the ground water and subsoil has interfered with preparing the ground for cultivation, but the effect of the sewage is to wash out the salt.

It is expected the several thousand sheep that are now on the farm will increase so that 50,000 will be sold annually. It is also the plan to establish dairies.

FAILURE OF "OPEN ACCESS" LIBRARIES

THE system of "open access" to the shelves of the public library at Bishopsgate, London, Eng., has resulted in the theft of over a thousand volumes since 1895 and now the system will be abandoned. There is quite a difference of opinion as to the advisability of this system, the friends of it holding that the cause was not in the system itself, but was due to poor management of the director. The director, Mr. C. W. Goss, stated that the books stolen were mainly those of fiction and were not taken for the money they would bring, but were taken surreptitiously to be read at home, were mislaid for a long time and probably destroyed to hide the offense. To prove this he stated that parcels of books were often returned through the mail anonymously and books have been found hidden away in parts of the library where they did not belong. The class of borrowers were not from the poor quarters either. Many books were cut and defaced and plates and illustrations torn out. It seemed impossible to prevent this notwithstanding the strictest supervision. It was found also that many persons hid books so that they could have them when wanted. Another objection to the "open access" system lay in the fact that the readers had little idea of the classification and returned books to the shelves way out of their order. The director has arranged so that a student can have brought to him in the reference library all the work in the institution on the subject being investigated and the student will then make his selections, taking home and reading at his leisure as many volumes as required.

The originator of the "open access" system, Mr. J. D. Brown, chief librarian of Clerkenwell, laid the blame for the breakdown of the system to the fact that there were no safeguards such as should be in every municipal library. He said that the catalog was printed before the books were purchased and thus many volumes recorded were never on the shelves. Then, too, the originality of the system of cataloging created such confusion that it was impossible to tell what books were in the institution. Instead of employing separate cards for each book in the library so that the mark of the borrower could be placed thereon, the borrowers' names were made the basis, with the result that, in tracing any book, it was necessary to overhaul all the tickets of the readers. Mr. Brown claimed for the "open access" system the advantage that it taught the reader to treat the books as if they were his own. The three essentials for the proper conduct of an "open access" library, according to Mr. Brown, were close scientific classification, correct registration of books borrowed, and the proper working of the shelves so that one might distinguish at a glance class from class and book from book. Placing a system of colored dots on the back of books according to their shelves was found to be the most efficient method of dealing with the latter question.

MUNICIPAL TAXATION AND ASSESSMENTS

FOR several years the League of Iowa Municipalities has been studying the question of taxation and assessments and the latest progress of the work is given in a report of a committee on Taxation and Assessment, of which Mr. C. A. Stutsman was chairman. The following extracts have been made from this report:

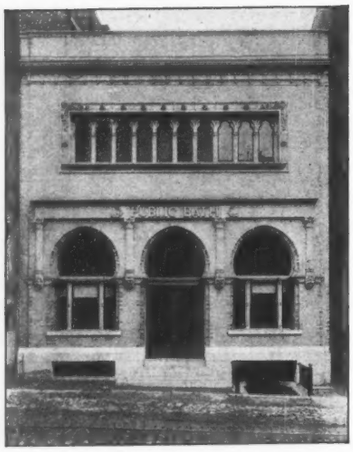
The purpose of the report was to present briefly the developments of the past year along the lines indicated by the decisions of the Iowa courts bearing on the question of municipal taxation and assessments. The most important question for the Iowa cities was the constitutionality of the statute which gave authority to make certain public improvements and assess the cost thereof to abutting property according to the foot front plan. The Supreme Court of the United States, in the case of Norwood vs. Baker, decided that an ordinance which provided for the opening up of a street and charging the entire cost thereof, including condemnation proceedings, against the abutting property was unconstitutional because it assessed the cost of the improvement without regard to the benefits conferred. This decision was reversed by the same court, in the case of Parker vs. Detroit, in that the idea of the former decision was not to declare unconstitutional a statute which prescribes the levying of a special tax against the abutting property for the cost of the improvement along said property, without regard to the benefits conferred. The Court held that in the Norwood case the act was one of confiscation and not a valid exercise of the taxing power. In the light of this decision it would seem that the Iowa statute providing for public improvements is not unconstitutional. The Supreme Court of Iowa also has declared the act constitutional. There is much to be said in favor of the position that the statute should be modified so as to levy the tax in proportion to the benefits accruing to the property assessed and paying the balance of the improvement out of a general fund raised by taxing all the property of the municipality. There is a valid objection to the statute in that property owners, who have been assessed for the whole amount of an abutting improvement, would be discriminated against by any change in the law that would relieve property owners in the future from payment of a part of the improvement.

A section of the Constitution of the State provides that cities may not contract indebtedness in excess of 5 per cent. on the value of taxable property for the purpose of taxation. The Code of 1897 provided that all taxable property should be valued at its actual value and assessed at 25 per cent. of such value. A question then arose as to the meaning of the Constitution in regard to the word "value," whether it meant actual value or assessable value. An act of the Legislature limited the taxing power of municipal corporations to one and one-fourth on the actual value of all property. The result of this act is to declare that the Constitution means 5 per cent. on the assessable value of property.

The committee considers that this principle limiting the right of municipalities to exceed a certain limit of indebtedness is sound but should not be arbitrary. It has prevented some cities, which have reached their debt limit, undertaking the municipal ownership of public utilities. The legislature should make provision for such emergencies, especially when the people of a city have voted for such ownership.

The committee believed that the right of cities to levy special taxes for certain purposes, such as libraries, water, light, etc., should be abridged. All such special taxes should be abolished and the section providing for a 10 mill levy for general and incidental expenses should be so amended as to increase the amount of the levy for special purposes such as these. The Code does not allow funds to be diverted from one purpose to another and, consequently, money is often borrowed at interest for such purposes. This is not right and an injustice to tax payers. A general fund should be provided to meet all such needs.

ALBANY'S PUBLIC BATH



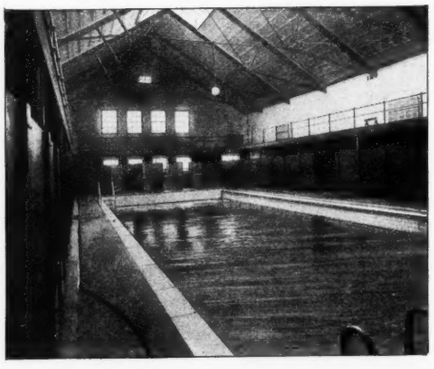
EXTERIOR VIEW OF PUBLIC BATH

A PUBLIC bath is a step in the interest of public morals, clean living and the betterment of citizenship and this is coming to be recognized more and more by cities throughout the country. The establishment of a public bath at Albany, N. Y., has opened the way in that city for further increase of this important adjunct to the city and the popularity of the present one proves that the people will welcome as many such institutions as the city may erect.

The public bath was opened on December 17, 1901, and, while not of pretentious proportions, is a decidedly attractive building. The arrangement of the rooms could not be better and the sanitary conditions are of the best. At the entrance to the building is a large waiting and reading room and the superintendent's office. Back of this is the private bath with two tubs and ten showers and toilet rooms. At the rear of the private bath is located the swimming tank surrounded on two sides by thirty-eight dressing rooms and these are so arranged that no one can enter the pool without first passing through a small shower bath room, in which every one must take a shower bath. This tends to keep clean the water in the pool. Above and around the plunge is a gallery for running or for visitors. The tank itself contains 70,000 gallons of water and is lined with white tile. The depth of water varies from four feet at one end to seven at the other. There is a diving platform on one side about five feet above the surface of the water. The water is kept fresh by a steady inflow of pure water and is kept at a moderate temperature by steam pipes. The dressing rooms are of black marble, the walls of white tile and the ceiling of metal painted a light green. A large skylight admits an abundance of light to the pool and rooms.

So popular has the bath become that Superintendent Long and his attendants have been compelled to turn many away each day for they do not wish to have the bath overcrowded. The fact that at times a small fee is charged has caused some to grumble, but many poor people favor a small fee for it relieves them from the feeling that they are receiving charity. The bath has not been long enough in use to admit of the collection of many statistics, but thus far the average attendance has been about 150 a day. From the first of April to the twelfth the attendance amounted to 1,861, of which 875 were boys, 125 girls, 763 men and 98 women. The women and girls are chiefly of the working classes, the kind for whom the bath was mainly intended, and the attendance of all sexes is constantly growing. It is stated on local authority that bathing parties are coming into vogue among the young ladies of the city.

On Monday, Wednesday and Saturday a fee of 10 cents is charged resident patrons and 25 cents for non-resident. Tuesday, Thursday and Friday are the free days. Women and girls over fifteen years of age are admitted every day except Friday from 9 A. M. to 12:30 P. M. and men and boys over fifteen from 2 P. M. to 9 P. M. On Fridays the hours are reversed. Soap, towels and trunks are furnished free for the men and boys and bathing suits for the women and girls. Lockers may be had at $1 a year for all who wish to keep their own suits and towels. These will be washed, dried and returned to the locker by the attendants. Instruction is given in swimming at $6 for twelve lessons in a class and $7.50 for twelve individual lessons. Individual instruction per lesson costs 75 cents. Among the rules governing the use of the bath is one prohibiting the use of the tank for more than thirty minutes and no lingering about the dressing rooms. Strict rules are enforced in regard to conduct of the bathers and on the walls are instructions as to the best time to bathe and what to do in order to get the best effects of the bath.



SWIMMING TANK—PUBLIC BATH

About $30,000 has been expended for the construction of the bath, but the money could not have been used to better advantage. This bath has proved the popularity of such an institution in the city and it is probable that others of like character will be erected in the near future.

DAYTON ELECTROLYSIS CASE DECIDED

FOR eight weeks the Court of Common Pleas, State of Ohio, has been sitting in the case of the City of Dayton, plaintiff *vs.* the City Railway Company, of that city, defendant; many expert witnesses were examined for both sides, and a remarkable collection of pipes, valves, photographs, and other exhibits were produced. The questions before the Court for consideration were some that have never been considered before, and scientific principles were involved never yet passed upon by a court of law. This case has been followed since its beginning by THE MUNICIPAL JOURNAL, and the issue of March, 1902, contained a complete history of the trouble from the pen of Mr. Edwin P. Matthews, City Solicitor of Dayton, Ohio. Judge O. B. Brown has at last rendered his decision in this case, the substance of which is as follows: It was maintained by the city that the rails of the company were not adequately bonded, and that electricity escaped from the rails to the water pipes, along which it found a return path to the power house, causing great damage through electrolysis wherever the current again left the pipes. Many leaks and breaks occurred because of this destruction of the pipes. The city was unable to prevent the damage, but it lay in the power of the company to stop the trouble. The defendant, although advised of the trouble, had done nothing to remedy it, therefore the city prayed that the defendant be compelled to adopt such system of protection and such devices as might be necessary, to prevent the damage in the future.

The company in answer denied that its rails were not properly bonded. It also denied the existence of electrolysis and that any system can be adopted with concurrence of the city which would prevent such electrolysis. Furthermore, the single trolley system is the most simple and inexpensive and the best system, and the city concurred in its installation.

Taking up these several points, the Judge goes on to say, in substance, that the railway, by reason of its franchise, has a perfect right to the use of the streets. On the other hand, legislative authority permits the city to lay pipes for supplying pure water to its citizens. Each of these utilities are beneficial to the public and entitled to its rights without interference of the other as long as neither of the parties to the suit makes other than an ordinary use of its property. No cause of action can lie against either party while in its rights. The facts in the case show that without doubt the escaping electric current from the rails of the company has caused electrolysis of the pipes of the water supply, for pipes that have been buried in the soil not within the vicinity of the rails have not changed in any way for

over thirty years. The pipes, on the other hand, within the "positive districts" which have been found to be near the power house of the company, have been destroyed.

After reviewing the part of the testimony relative to instances where water mains have burst through weakness caused by electrolysis, Judge Brown cites the test that were made to determine what part the presence of the gate boxes connected with the water mains played in carrying the current in the vicinity of the rails to the pipes. Tests by experience showed that only two of the fifty gate boxes were in mechanical, and only one in electrical contact with the pipe or rail.

The establishment of a double trolley system by the railway or the building of a conduit, could not rightly be compelled by the city, as requested "because the expense involved would be far too great for the income."

The testimony showed that the city was powerless to adopt any method whatever to protect its pipe system, both on account of the expense and because of the great labor involved. On the other hand the company must continue to conduct a single trolley system. The remedy lies in some system to be adopted by the co-operation of the two parties to the suit, which would reduce the electrolysis to a minimum. The rails should be adequately bonded and frequently inspected, and heavy copper cables should carry the return current across bridges and under railroad crossings. The rails should be connected to the negative bus bar of the dynamo, which would thus increase the conductivity of the line. At proper places the pipes should be insulated, as is done in other cities.

The Court therefore finds that the railway has been conducting its road in a negligent manner, causing continual damage to the water pipes, which the plaintiff cannot prevent. "It is therefore the duty of the Court to enjoin the defendant from so operating its railway and to compel it, within a reasonable time, to introduce such improvements in the system in order that the operation of the single trolley system authorized by the franchise and contract will be in accordance with the present standard of the art of operating single-trolley roads. The plaintiff shall co-operate to that end. . . . The costs will be adjudged against the defendant."

MUNICIPAL MATTERS DETERMINED IN COURT

LIABLE FOR DEFECT IN STREET.—A decision of a Kentucky court holds a street railway company liable for a defect in a street caused by the projection of the rails, although originally properly laid, where the street pavement had fallen away from them.

NO TITLE TO RIVER FRONT.—In the United States Circuit Court in Mobile, Ala., Judge Toulman rendered a decision against the city involving the ownership of wharf property along the river front. While the legal title to the property was in the name of the city, it was stopped from asserting that title because it had granted land owners the right to build docks and bulkheads. The case has been carried through the city and State courts and involved the possession of the entire river front, valued at $20,000,000. The city claimed title under an act by General Assemblage of Alabama in 1867.

WHISTLE TOO LOUD.—In a Georgia court it has been recently held that the blowing of a factory whistle at unseasonable hours in a well populated community in so harsh and terrific a manner as to seriously interfere with the reasonable enjoyment of a person's habitation, is a nuisance which may be enjoined.

LIABLE FOR SIDEWALK EMBANKMENT.—The Supreme Court of Pennsylvania, affirming the judgment of a lower court, has decided that the city of Easton is liable for the injuries sustained by a person who fell down an embankment on the street. The street along which the plaintiff was walking one night had been raised and a property owner had built his sidewalk four feet higher than the adjoining. The walk was to have been made twelve feet wide, but only eight feet of it had been constructed, the remaining portion being a slope down to the street. Down this the plaintiff fell, and although he was able to work for a few days, serious trouble developed in his leg which had to be amputated. Damages to the amount of $5,500 were awarded.

CAN CUT DOWN SIGNBOARDS.—Judge Kreuse, of Buffalo, N. Y., has handed down a decision in favor of the city regarding signboards. The company operating the signboards had built the same much higher than the city ordinances allowed and the police had cut down one of the boards. The law places a limit of seven feet to the height, but these were very much higher. The Court held that, while the boards were on private property, their proximity to the street made them a danger to pedestrians as a strong wind might blow them down. The judge described them as increasing the danger from fire, unsightly in appearance, as a means behind which many nuisances are committed and as depreciating the value of the surrounding property. Their constant tendency was to produce uncleanlinesss and unsanitary conditions and are thus a common nuisance. A suit brought against the same company in Chicago, Ill., has not yet been decided.

NO WATER, NO SEWERS.—Judge Dikon, of Passaic, N. J., in a recent ruling decided that the city cannot collect an assessment for a sanitary sewer on a street where there is no city water. The city must first lay water mains so that the owners of property can use the sewer.

RAILWAY COMPANY NOT LIABLE.—The Appellate Division of the New York Supreme Court has held that a company is not liable for injuries sustained by a passenger arising from an act of a conductor in an emergency. A street car having stopped, the plaintiff was about to alight, when a large truck came up behind the car, the driver trying to check his team. The horses slipped on a wet pavement so that the pole was in danger of striking the car. The conductor started the car suddenly to escape the danger and the plaintiff was thrown against the dashboard, sustaining injuries. The court held that the act of the conductor was done in a moment of peril to himself involuntarily, and, as the plaintiff's fall was not due to a negligent starting of the car, the defendant was not liable.

CITY MUST GRANT RIGHTS.—It has been decided that the consent of the city authorities must be obtained before a railway company can lay tracks in any street of the city of Atlanta, Ga. In 1891 the General Assembly had authority to grant corporate powers to a street railway company, though the consent of the corporate authorities of the city or town in which the lines of the street railway were to be located had not first been obtained. Such powers, however, do not authorize the construction of a line of street railway upon the streets of any town or city until the consent of the corporate authorities had first been obtained.

CITY LIABLE FOR DEFECTIVE SIDEWALK.—The verdict of the jury in the case of Jordan *vs.* Seattle placed the liability for injuries from a defective walk on the city. The Supreme Court decided that the only point in dispute, the plaintiff's negligence, was a question for the jury. The plaintiff was injured by falling into a hole in a sidewalk over which she was passing in the night. Evidence showed that she knew of this hole before the accident, had cautioned her children who were with her, about it, and could have avoided it by passing on the opposite sidewalk. The court, in the decision, stated that the walk was in daily use, others passing over it without injury, and that the city left it open, tending to show that the hole could, with reasonable care, be avoided. Evidence showed that the plaintiff did not assume the risk as she took precaution and attempted to avoid the peril. As the walk could be used with reasonable care the plaintiff was not under obligation to seek a better walk. The question for the jury was whether the plaintiff had used due diligence in trying to avoid the hole.

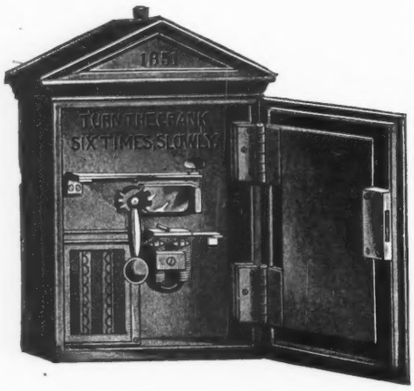
THE DEVELOPMENT OF THE FIRE ALARM TELEGRAPH

Invented by Channing—Boston First City to Install It—How the Old System Worked—Many Improvements Result in the Present Excellent System

By H. H. Easterbrook*

FIFTY years ago, Thursday, April 29, 1852, at 8:25 o'clock p. m., the first fire alarm of fire by electricity, was given from signal station No. 7, of District 1, located on Cooper Street church, corner of Cooper and Endicott streets, Boston, Mass., for a small fire in building at corner of Charleston and Causeway streets. The alarm was rung in by J. H. Goodale, a citizen, and received at headquarters and sent out on the tower bells by Charles Carlton Coffin, afterwards famous as a war correspondent.

The electric fire alarm telegraph, which gave this alarm, was the original system and the first of what has for many years been known as the Gamewell system. It originated with Dr. William F. Channing, of Boston, who was born in Boston, February 22, 1820, and died there February 22, 1901. Dr. Channing was a son of the Rev. William Ellery Channing, the noted Unitarian divine and author.



ORIGINAL SIGNAL BOX, BOSTON

IDEA CONCEIVED

When Prof. S. F. B. Morse invented telegraphy, and before it was made a complete success, Channing in 1839 had conceived the idea of applying it to fire alarm purposes. On June 3, 1845, he presented his ideas of an electric fire alarm telegraph system to the public in a communication about half a column in length, published in the Boston *Daily Advertiser*, under the caption, "Morse Telegraph for Fire Alarms." In this he outlined a system similar to the one later constructed, and in closing he said: "I suggest this project to the consideration of the authorities of the city on this account specially—that Boston has been and is entirely behind hand in her arrangements for spread of alarms of fire, and would thus have an opportunity of retrieving her character by taking a step in advance of other cities." Six years later that city accepted his suggestion, took a step in advance of other cities and for the next quarter of a century or so was a leader in many improvements in the fire service.

PROF. FARMER JOINS CHANNING

Associated with Dr. Channing in the construction and introduction of this system, was Prof. Moses G. Farmer, of Salem, Mass., who was the inventor of most of the machines and appliances of the system and the electrician who put it into operationn and made it a success.

In 1847, by request of some prominent telegraph men, he devised a machine for striking fire alarms on tower bells, by applying electrical attachments to a tower clock striking apparatus, and this was the first machine ever devised for striking fire alarms by electricity.

Mayor Josiah Quincy, of Boston, in his inaugural address, January 3, 1848, recommended that the city council consider an electric fire alarm system, and money was appropriated for the purchase of two bell striking machines which were devised and constructed by Prof. Farmer. When completed, one was attached to the Court House bell and the other in a telegraph office in the same building, and the experiment of striking both simultaneously from New York City by wire was a most gratifying success. No further use was made of these machines at this time.

BOSTON ADOPTS THE SYSTEM

In March, 1851, Dr. Channing sent a communication to the Boston city council, outlining his ideas, presenting the result of his experiments, accompanied by plans, etc., and suggested the construction of such a system by the city. A crude exhibition was given and a committee appointed to consider the matter and subsequently reported in its favor and $10,000 was appropriated by the city for its construction.

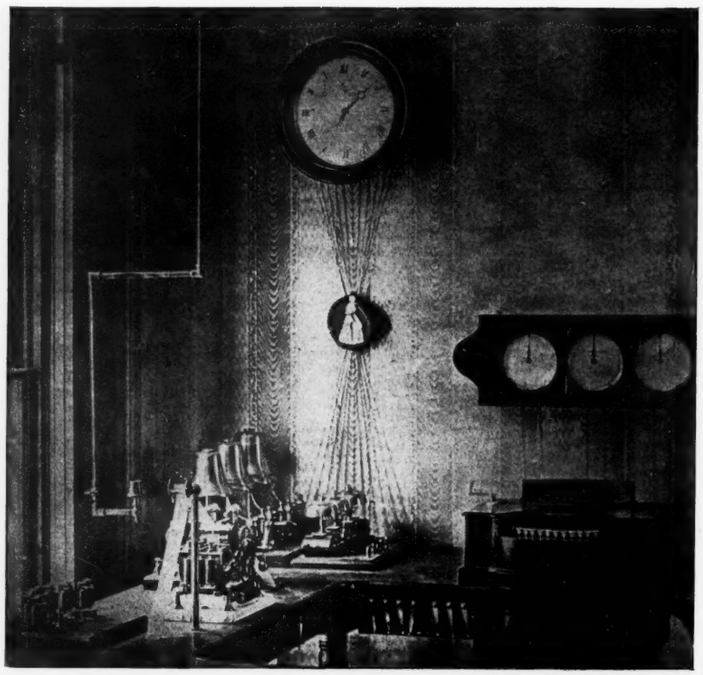
At this time, with the exception of the two machines constructed by Prof. Farmer in 1848 and stored away in an old lumber room, there was not a piece of machinery in existence for the system, which existed on paper only, but so complete was the confidence of the city council and the public in Dr. Channing's ideas and plans and Prof. Farmer's ability as an inventor and electrician that the money for its construction was appropriated without much opposition.

FARMER MADE SUPERINTENDENT

Dr. Channing and Prof. Farmer first met in the spring of 1851 and it was at Dr. Channing's request that Prof. Farmer was selected superintendent of construction, and on December 29, 1851, he was elected superintendent of the system by the city council. In July, 1851, he resigned his position with the Vermont Telegraph Company and henceforth devoted his entire time, energies and knowledge to the construction and perfecting of this system.

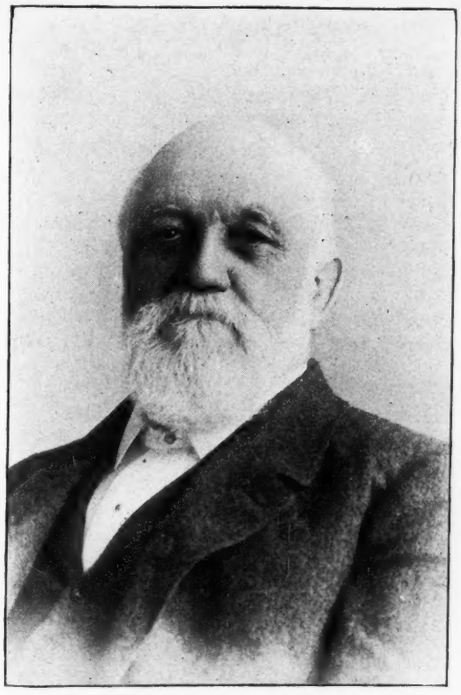
COST OF THE SYSTEM

It required a year to construct the system and its entire cost was about $15,000. Its original estimate was $7,596.60. Prof. Morse, inventor of the telegraph, was paid $800 for a license for the use of



ORIGINAL FIRE ALARM OFFICE, BOSTON

* Editor of *The Fireman's Herald*, New York.



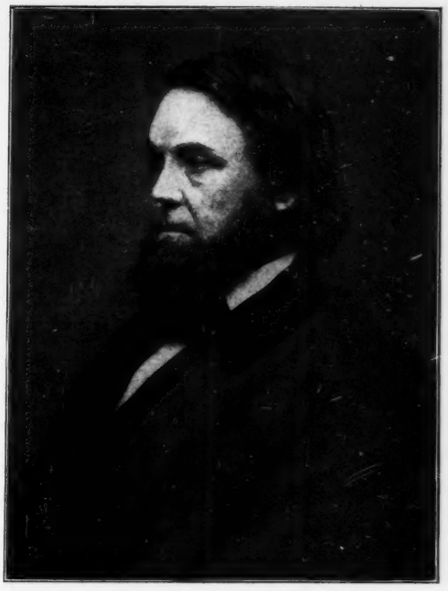
JOHN N. GAMEWELL

his patents. It was completed and went into service at noon April 28, 1852, and the first alarm was sent in the following evening.

The system had its headquarters in what is now police station No. 2 in Court Square, near the City Hall, where its central office machinery was located. An accompanying illustration shows this machinery.

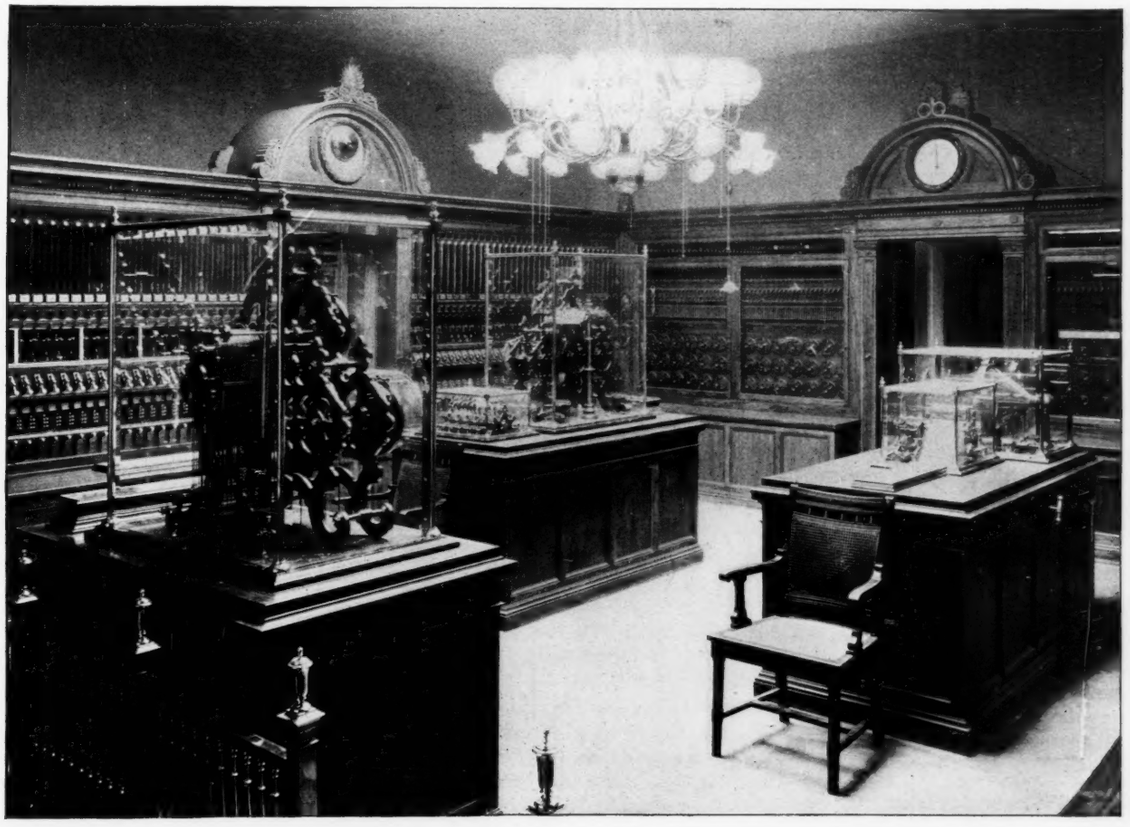
HOW THE OLD SYSTEM WORKED

The signal stations of each district were numbered from one to ten. The district number was struck on tower bells and station number on small bells inside boxes. When there was an alarm some twenty-five blows would be struck on bells to notify firemen and others that there was an alarm. This would be followed immediately by striking several rounds of the district number and at the same time the station number was striking in all the signal boxes. Firemen and policemen would rush to signal boxes to get the box number and at night the police, then known as the "watch," would spring their rattles and cry out the box number through the streets. There was no engine house gongs, as only hand engines were in service and none were necessary. The method of striking of bells to announce the coming of alarms and the crying out of the box number by the police existed only for a short period when they became unnecessary.



DR. WILLIAM F. CHANNING

It required but two or three turns of the signal box crank to record an alarm at headquarters if the crank was turned slowly. Six turns was the number given in instructions displayed inside the box. If the crank was turned rapidly the machinery at headquarters would not adjust itself properly to record the alarm, and as most people who gave the alarms were excited they would turn the crank too fast. This was partially obviated by changing the



PRESENT FIRE ALARM OFFICE, BOSTON

MOSES P. FARMER

instructions to twenty-five turns of the crank, and in counting they would naturally turn slow enough at some period of the twenty-five turns to have it properly recorded at headquarters. The number of turns were subsequently reduced a few at a time until the required number only were used.

Two employees were constantly on duty at headquarters and were necessary to receive and send out alarms. The machinery of this first system was constantly being improved and perfected and it took a year or two to get the system into an entirely perfect working condition, but it was a success from its start and the city was well satisfied with its expenditure.

In 1854 Channing and Farmer applied for patents on their inventions and they were granted May 19, 1857.

PRESENT BOSTON SYSTEM

The present Boston fire alarm is the direct successor of that of Channing and Farmer and is one of the most perfect and complete of modern systems. Some of the original machinery of the old system is now on exhibition in the Smithsonian Institute at Washington, D. C., having been loaned by the city of Boston.

The old direct system of Boston was changed and the first alarm by the present system was from box 45 at 7:05 p. m., April 28, 1864.

MR. GAMEWELL BECOMES INTERESTED

In March, 1855, Dr. Channing delivered a lecture at the Smithsonian Institute at Washington on the fire alarm telegraph. Shortly after this lecture John N. Gamewell, postmaster and telegraph operator at Camden, S. C., was at the Institute and learned of the Dr. Channing invention, which so interested him that he journeyed to Boston and jointly with James Dunlap, a wealthy resident of Camden, S. C., purchased of Messrs Channing and Farmer, territorial rights for the construction of their system.

SYSTEM INSTALLED IN ST. LOUIS

In the latter part of 1856 he contracted with St. Louis to construct a system to consist of forty-five signal stations, four Polsey tower beli strikers, two bells and five signal box circuits, the necessary central office machinery, etc., to cost $45,000. The cost of signal station were $250 each. The work was completed and the first alarm sent in February 25, 1858. This system was similar to the Boston with the improvements made up to that time. St. Louis was thus the third city to possess it. James N. Gardiner, now with the Gamewell Company, was its first superintendent.

In 1859 Mr. Gamewell purchased of Messrs. Channing and Farmer all their remaining patents.

When the War of the Rebellion commenced in 1861, Mr. Gamewell went to his home at Camden, S. C., where his fire alarm patents were confiscated by the United States Government and sold at public auction by a United States marshal on the City Hall steps at Washington in May, 1863, for a small part of their value to John F. Kennard & Co., of Boston.

GAMEWELL COMPANY FORMED

Early in March, 1866, Mr. J. N. Gamewell recovered some of his confiscated rights and was admitted to the firm of John F. Kennard & Co., which was then changed to Gamewell, Kennard & Co.

In February, 1867, John F. Kennard retired to accept the position of superintendent of the Boston system and the firm name was changed to Gamewell & Co. In June, 1877, it was again changed to the Gamewell Fire Alarm Telegraph Co.

The original system was constantly improved and by many inventions and patents it has been brought up to the present excellent system used in all cities and many villages and towns.

INVENTION OF THE REPEATER

One of the most valuable and important improvements made since the original system was constructed, is the repeater which made automatic systems possible and enabled hundreds of cities and towns to possess a fire alarm telegraph which could not afford the central office system of large cities. The improvement was invented by Edwin Rogers of Boston, who was connected with the Boston system as far back as March, 1853, and is now with the Gamewell Company.

PRESENT SIGNAL BOX, BOSTON

Portland, Me., had the first automatic system and the first alarm of fire ever given automatically was from station 31, April 12, 1867. Mobile, Ala., was second the same year and from that time to the present electric fire alarm systems have been purchased rapidly throughout the entire country.

ORIGIN OF THE SLIDING POLE

THE recent death of Stephen Paine, a retired colored member of the Chicago department, has renewed the old story that he invented the sliding pole which was first used in the station of Engine Company 21 at Twelfth street and Third avenue, the only colored company in that department, of which he was a member and driver.

The idea of a sliding pole originated in 1878 with Captain David D. Kenyon (white) of that company, a brother of Joseph L. Kenyon, now chief of the Twelfth Battalion. At that time Matthias Benner was chief of department and M. W. Shay, Chief of the First Battalion, in which 21 Engine Company was located.

Captain Kenyon, who was a most intelligent and progressive fireman, and a most competent commander, wanted something better than the slide on side of stairs in his station, which was also used in other stations. He conceived the idea of the sliding pole and Steve Paine procured at a nearby lumber yard a 4 x 4 piece of timber which members of the company, under Captain Kenyon's direction rounded down into a pole three inches in diameter, which was sandpapered and rubbed down with paraffine to a smooth surface.

It was erected as an experiment from the hay loft window at the rear of the station and its trial proved a most satisfactory success. Obtaining permission from Chief Benner to cut a hole in the floor and run the pole from bunk to engine room on condition that he make good the damage done if it was not a success, the pole was placed there April 12, 1878, and was the first sliding pole ever used in a fire station. George Reed, a member of the company, now a member of the police force, was the first man to slide down the pole.

It was a success from the start and this company were soon crowding the others hard in rapidity of hitching. May 24, a second pole was erected in this station and later a nickel plated iron pole was erected, and about 1883 brass poles were used.

ABSURD FIRE REGULATIONS IN BERLIN

WHILE the fire regulations in the German capital are, in many respects, far superior to those obtaining in other cities in the world, the rigidity with which they are enforced, irrespective of circumstances, makes some of them exceedingly foolish. Just as the men are trained to act only through orders of a superior and are not allowed to think for themselves even in emergencies, so the other regulations deserve the ridicule of sensible persons.

In Berlin as soon as an alarm is turned in the owner and occupant of the house are entirely absolved from all responsibility. The fire department and the representative of the insurance companies take charge, and the owner is excluded from his own apartment until the insurance adjusters have made an inspection and estimated the damages, which are promptly paid. If he or any of his family or servants interfere with anything about the premises after an alarm is given they may possibly get off with a fine, but are more likely to go to jail. If an alarm is not given promptly insurance is forfeited or becomes a question for litigation, but the moment the alarm is touched the fire becomes the business of the municipality, and the owner of the property must keep his hands off. You frequently hear of people being arrested for rushing into burning houses to save children or heirlooms or other precious articles. It was only recently that a man was fined twenty marks for trying to save a canary bird that had been left in the apartment when the family fled from the flames. These regulations are based on the theory that the fire department is competent to take charge of any emergency, and that the insurance companies are able to pay for whatever is injured or destroyed, and they are very prompt and unscrupulous.

An American, Mitchell, had a curious experience in an apartment where he was spending last winter. Something caught fire in his rooms early in the morning and the servants rushed out and gave the alarm. In the meantime the senator was awakened, and, organizing a bucket brigade of the members of his family, he extinguished the flames with bowls and pitchers and water from the bath room. When the firemen arrived the family was sitting around calmly talking it over, but the police marched them all off to jail for interfering with the fire department. After the alarm was given they should have locked their doors and left the house, placing the entire responsibility upon the fire department. It was unlawful for them to do anything toward putting it out.

Another American, Professor Boice, had a similar experience. When a fire caught in his apartment he rushed across the street and let off an alarm box he had always noticed there, but had never had occasion to use before. Now it so happened that the street upon which Mr. Boice lived is the boundary line between the City of Berlin and the town of Charlottenburg, one of its suburbs, and the alarm box being on the Charlottenburg side the fire department of that place responded. When they arrived they found that the fire was in the City of Berlin, and therefore they would not touch it. The foreman hurried to the nearest box on the Berlin side and turned in an alarm, and then ordered the Charlottenburg firemen back to the engine house. Within a few minutes the Berlin fire department came rushing up and put out the fire.

In the meantime Mr. Boice had been arrested for giving a false alarm in Charlottenburg, a misdemeanour which is punished by a heavy penalty. It would not have been a false alarm, of course, if it had been on the Berlin side of the street, but as there was no fire in Charlottenburg it was a crime to give an alarm in that city. Mr. Boice was not aware that his street was a boundary line, but the German law does not recognize ignorance as an excuse for the violation of city regulations.

Every citizen is bound to know what the regulations are, for they are printed in large volumes and are sold for six marks by all booksellers. Nobody but a policeman can remember half of them, but the fact that they are forgotten only aggravates the offence.

MEAT INSPECTION IN GERMAN CITIES

LIKE everything that is undertaken by the city or state governments in Germany, the examination of the meat supply is done in the most careful and scientific manner. The city of Dusseldorf will serve as a model for the rest. Here, in the municipal slaughter houses, all animals are inspected by a staff of veterinary surgeons and the meat immediately inspected. Meat, tissue and blood pass under the microscopes of a corps of experts. Meat that obviously contains disease it is destroyed at once. If, however, it is unsatisfactory, but not detrimental to health, it is sterilized. Very often it is necessary to destroy only a portion of the meat, the rest being treated so that no harm could arise from its use.

Both imported and domestic meats must pass the inspection and during 1901, over 7,000 carcases were found wanting upon inspection. There is little chance for deception on the part of dealers inasmuch as all meat that is passed as fit for food, but of an inferior quality, must be sold for what it is worth and for what it is. The city authorities look after all this meat and sell it direct to the public in a place set apart for it in a portion of the slaughter house, although purchasers do not have to enter the slaughter house itself. While the butchers are not allowed to sell this class of meat themselves, the city pays them a fair price for it plus a fee for selling. Even after meat has passed inspection, the dealers are not permitted to remove it until after six o'clock on the day killed. It must hang for at least four hours in cold storage.

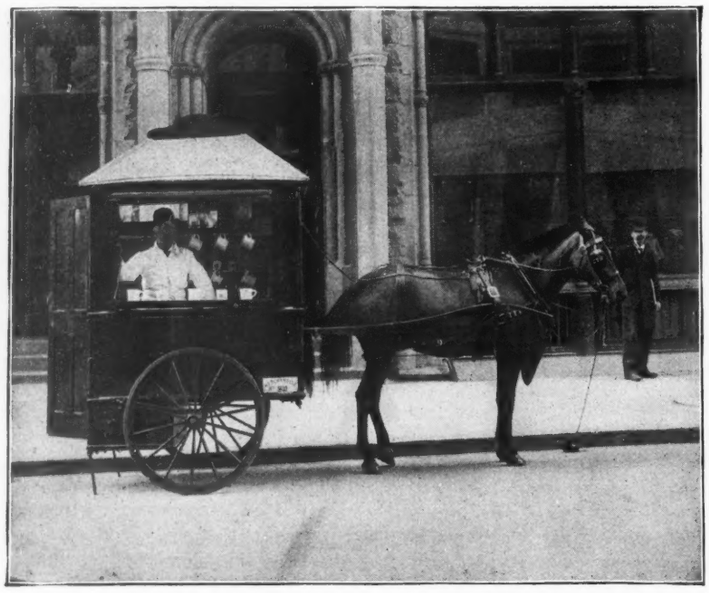
About thirty microscopists are constantly at work inspecting the meat and their work costs the city $2,105.22 a year. During the past year 63,490 portions of meat were examined. In a laboratory attached to the slaughter house all diseased meat is subjected to bacteriological tests. The microscopists are not bacteriologists themselves but have been so trained that they can detect whether meat is fit for food or not. What they reject is sent to the laboratory for further tests.

The Dusseldorf slaughter houses are large institutions and comprise many departments. Markets, cold storage, machines for sterilizing and ice manufacture, laboratory, etc., are included. There are provided places for the butchers' horses and dogs, a restaurant for the employees and others there on business and a hotel for the accommodation of farmers from out of town. The houses have their own water and electric light supplies and sell a portion of the ice manufactured, amounting to $6,000 a year. Of the 130,000 animals slaughtered during the year, half were pigs and the whole revenue of the department is estimated at $107,395.

COFFEE VAN FOR FIREMEN

WHENEVER there is a large fire in New York City such as would required at least three alarms, the Church Temperance Society is notified and sends its Firemen's Coffee Van, from which hot coffee is furnished free to all the firemen as they wish it.

When such a fire as described occurs and the firemen are liable to be on duty for several hours, one of the Fire Chaplains telephones to the lunch wagon which the society maintains on East 23rd street. The man in charge immediately repairs to the stable where the coffee van is housed, hitches up and starts for the scene of the fire. Meanwhile he has notified a restaurant to have ready twenty-five gallons of coffee in one of their patent insulated tins which keep the coffee hot for hours. The wagon is allowed within the fire lines and another wagon that is being built will be equipped with a gong, giving it the right of way through the streets. The Chaplain take charge of it when once on the ground and many a fireman has blessed the coffee it contains when at work at some fire on a bitter, wintry night.



FIREMEN'S COFFEE VAN OF CHURCH TEMPERANCE SOCIETY

As may be seen from the photograph the wagon is about the size of a hansom cab, but is hung low in the axle. It is painted dark red and lettered in gold.

To show how much this wagon is appreciated by the Fire Department, the following communication from one of the Chaplains expresses the sentiment of the others "I take great pleasure in conveying to you the keen appreciation and gratitude of the firemen for the generosity of your admirable society. The Thanksgiving fire was the worst that has occurred in years. The next day men were compelled to stand watch for twelve hours in the cold, raw wind. It being Friday, none or few of them could eat meat, and the presence of the coffee van was more than a blessing. Deputy Chief Duane told me that never in his long experience was there such a gratifying absence of signs of liquor, and he attributed it entirely to the good coffee."

GENEVA'S GARBAGE SYSTEM

THE collection of garbage in the United States is, in many cities, undertaken by the municipal government itself, while an equally large or larger number let this work out on contract. In Switzerland and other countries of the Continent, the public utilities are largely in the hands of the cities themselves, but in Geneva the removal of the garbage is performed by the city while the disposal of dead animals is in charge of private parties. The removal of other refuse, street cleaning, etc., is performed by the street cleaning department.

The population of the city proper is about 60,000 and the house refuse amounts annually to about 20,000 tons. According to the regulations, the wet and dry garbage is placed in iron cans in front of the houses each morning and carts remove the contents to refuse deposits in the country, from which it is sold to the farmers for fertilizer. All broken glass, crockery, metal scraps, etc., are set aside and collected in special carts which are sent around every Monday morning.

Sewers in every street carry off the sewage, rain water, etc., and nearly every house is connected with them. These sewers, which are in one system, empty into the River Rhone and tributaries. No attempt is made to use the sewage for purposes of cultivation, nor is there any pumping plant, and no process of filtration is employed.

The street cleaning department cleans the streets and removes the sweepings to the general refuse deposits referred to above. An annual appropriation of $36,090 is made for this department and for the removal of garbage and other refuse. The receipts from the sale of refuse to farmers amounts to about $8,000 per year.

The disposal of dead animals is let by contract to a private concern, but the removal of them from the streets is done by the street cleaning department. The contractor hires a yard from the city, for which he pays the city a rent of $300 per year, and there converts the flesh of the animals into a fertilizer by means of sulphuric acid. About one hundred tons of flesh are so treated every year. The system costs the city $400 for the rent of the ground, the initial cost of the buildings, services of janitor, etc., but, as the process is a satisfactory one, the city can afford to pay the difference between the returns and the outlay to secure a means of promoting the public health and hygiene.

The sanitary regulations in the city of Geneva are very strict. It is forbidden to place on the thoroughfares refuse of any kind. Each house must have several receptacles to receive the refuse and these receptacles must be of iron and have two handles. If there is no janitor attached to a building, the employees of the street cleaning department will carry the boxes out of the houses if they are placed on a level with the street and within sixty-six feet of the curb. After emptying them they will be returned to their places. From April 1 to September 30, all such boxes must be placed in position for emptying between 6 and 6:30 o'clock, and from October 1 to March 31, between 7 and 7:30 in the morning. In streets where there are markets, the boxes must be placed out between 12 and 1 o'clock in the day time on Wednesdays and Saturdays, and on other days as above. These latter regulations apply to all houses situated in courts, alleys, etc. Shops and their approaches must be swept before 7 o'clock A. M. in summer and before 8 o'clock in winter. People are strongly advised to sprinkle with water before sweeping.

MORE MEN AND LESS TAXES

Mr. Harry L. Marston, Chief of the Fire Department of Brockton, Mass., has sent us his annual report for 1901. Chief Marston reports that the apparatus consists of four second-class steamers of the Amoskeag and Silsby types, a third-class Clapp & Jones steamer and a first-class La France engine held in reserve. There is a Babcock aerial truck and portable water tower, a Gleason & Bailey truck and one Rumsey truck. There are in the service three double-tank chemical engines of the Babcock and Holloway types, four hose wagons, four supply wagons and a buggy and light wagon for fire alarm work. The expenditures for the department during the last year amounted to $55,390.96. While the value of the property where fires occurred was estimated at $2,351,212, the loss was only $21,108.31. The Chief recommends that more men be added to the department, reasoning that "the more men arriving at the fire with apparatus, the smaller the fire loss. The smaller the fire loss, the smaller the insurance rate. The smaller insurance rate, the smaller the tax on the people, as insurance premiums are taxes." A protective department should be established and signs, giving the location of the nearest fire alarm box, should be placed at all corners. He recommends that all the apparatus be equipped with rubber tires as they could be driven with a greater degree of safety.

WHAT THE POLICE AND FIREMEN ARE DOING

School for Police at Manila—Woman Organizes Fire Company—Street Cars to Carry Keys to Fire Alarm Boxes—Work of London Department—Oil Used as Fuel for Engines

WHOLE FORCE DISCHARGED.—At the first meeting of the new board of trustees of the town of Tonawanda, N. Y., it was voted to discharge the whole police force. It is usual for some change to be made in the force by each succeeding board, but nothing so radical has been done heretofore.

WOMAN ORGANIZES FIRE COMPANY.—After several attempts were made to organize a fire company at Norfolk, Conn., Mrs. H. H. Bridgman took up the matter. A call was issued for young men desirous of joining a military company and fifty men enlisted. From this company the fire company was organized and a New York woman donated 200 feet of hose to the men.

MUST PAY DEBTS.—The council committee of Minneapolis, Minn., on police have been much wrought up over the fact that there are men on the force that owe many debts and do not seem to be willing to pay them. One of these men was a captain and received $125 a month. The committee decided that, if the men did not pay their debts after a certain time they should be dropped from the force.

POLICE TO USE SHOTGUNS.—The police force of Zanesville, O., will soon be supplied with an efficient weapon for use against bank burglars and safe-blowers. Chief of Police Tracy has selected a design of magazine rapid fire shotgun which will discharge six loads of buckshot in two seconds. At first fifty of these guns will be put in use and not only the police, but also firemen, night watchmen and trustworthy residents in the business districts will be supplied with some of them.

STREET CARS TO CARRY FIRE KEYS.—A plan has been suggested to Chief Musham, of the Chicago Fire Department, providing that keys to the fire alarm boxes should be carried in every street car. Many times conductors or passengers on cars have been the first to see a blaze and could send in an alarm at once if a key to the nearest alarm box was handy. In the outlying districts the boxes all open with a key and it would be in these sections that a key in a street car would prove of service in preventing much delay for the firemen to reach the scene.

WHOLE FIRE COMPANY SUSPENDED.—Chief Engineer Watkins of Paso Robles, Cal., suspended the hook and ladder company because it failed to respond to fire drills. One of the reasons why the ladder company did not respond to a recent alarm is that the foreman of the company did not receive the support of the hose companies in his desire to be elected chief of the department. The chief has been sustained in his action by the trustees of the city who naturally held that the company had not done its duty and the chief has now organized a new company, notwithstanding the protests of the members of the old organization.

CAUSES OF FIRES.—The report of nearly every chief in the country usually contains a list of the fires of the year with their causes. Chief Musham of Chicago has digested these causes and has thus enumerated the principal sources of danger: First, the general use of oils in business or residence buildings for heating, cleaning, etc.; second, poor insulation of electric wires and their improper arrangement; third, poor elevator shafts; fourth, faulty construction of buildings due to lack of inspection by the authorities; fifth, accumulation of rubbish and inflammable material in basements and closets; sixth, construction of very high buildings for mercantile use.

MUST KEEP OUT OF POLITICS.—Fire Commissioner Sturgis of New York City has sent a letter to all the various organizations made up of members of the fire department warning them that they must not meddle with any legislation dealing with the department. No money must be collected to influence legislation or to test the validity of the laws. All members found to have violated this rule will stand a chance of dismissal from the department. The Commissioner claims to have knowledge of several cases where influence has been exerted by members of the department through their organizations and he holds that this is a violation of the rules of the service.

POLICE SCHOOL FOR WASHINGTON.—The plan of Major Sylvester, Chief of the Washington (D. C.) police, to install a school for the policemen has been adopted. As soon as the system is changed so that the police will have shorter hours of straight duty, the school will be installed whereby all may be more fully informed regarding modern methods of policing. This will especially be useful to the new men and will instruct them in the various intricacies of the law, police regulation, etc. The men will attend the sessions of the school during their reserve hour and it is the firm conviction of the Chief that the greatest amount of good will come from it in increasing the efficiency of the force.

TO USE OIL AS FUEL FOR ENGINES.—As the results of extensive experiments with fire engines in the Metropolitan Fire Brigade in London, England, Captain Wells, the Chief, has found that the economy of cost is not as great as he had anticipated, but other advantages are such as to make its use advisable. With oil steam can be gotten up more quickly than with coal or wood. It is found that low flash oil is the best, although dearer than the high flash. This because the latter is liable to carbonize and fill the tubes and thus make it dangerous for the fireman to light the fire. With the low flash oil this danger is not present. Already three new oil-burning engines have been added to the brigade and six others are to be built soon.

MEET OF ILLINOIS FIREMEN.—The Executive Board of the Illinois Firemen's Association has selected the 5th, 6th and 7th days of August for the holding of the fourteenth annual tournament at Blue Island, Illinois. Prizes to the amount of $1,600 will be awarded in contests. Teams from other states can enter free for all races. Blue Island is but a short distance from Chicago on the suburban lines and low rates will be made for the occasion. The officers of this association are: President, Mr. Charles C. Chain, Bushnell; Secretary, Mr. Walter E. Price, Champaign; Treasurer, Mr. M. T. Quirk, Arcola; Statistician, Mr. B. F. Staymates, Clinton. As stated in a previous issue of the MUNICIPAL JOURNAL AND ENGINEER, this organization has an accident indemnity that has proved itself most successful and worthy of imitation.

LONDON'S POLICE FORCE.—The report of Sir Edward Bradford, Chief Commissioner of the London Police Force, gives some interesting figures relative to that force. The force comprises thirty-two superintendents, 570 inspectors, 1,977 sergeants, and 13,268 constables or policemen. This makes a total of 15,847 as against 7,497 in Greater New York. For salaries the sum of $6,469,760 was paid for the London force and $11,153,133 for the police of the greater city. The report shows that the number of arrests had decreased materially from the preceding year in that the offences of a minor nature, such as drunkenness, ordinary assaults, etc., were 7,283 less than in 1899. Felonies increased slightly as also the value of the property stolen, but the number of arrests kept pace with the number of offences of all kinds.

BUFFALO *VS.* CLEVELAND.—A comparison has been made of police departments of Buffalo, N. Y., and Cleveland, O., by one of the newspapers of the former city. The cost of the Cleveland department amounts to $512,434.60 as against $794,840 for Buffalo. The service which the Rainbow City receives is very much better than that of Cleveland and the department is much better equipped. Cleveland has 390 men on the rolls, Buffalo, 782; five patrol wagons to Buffalo's seven; no rented telephones to 201 for Buffalo and but

584 miles to patrol to Buffalo's 637. Cleveland has no mounted police or bicycle squad, but Buffalo has an adequate force of each. The park police are included in the estimate for Buffalo, but this is not the case in Cleveland. Thus the difference of $282,405.40 in the cost of maintaining the two departments is readily accounted for.

SMALLPOX PUTS POLICE OUT OF BUSINESS.—The visit of a smallpox victim to a police station in Greenville, N. J., placed the officers in a peculiar predicament. When the patient appeared before the sergeant's desk and told of his trouble, the sergeant immediately notified the health board, and inspectors soon arrived and placed the station under quarantine. An officer was placed at the door and would not allow any one to go in or out. When the night platoon, whose uniforms were in the station, arrived to go on duty, their brother officer would not allow them to enter and so they did duty in plain clothes and the captain moved his office to a nearby saloon. Some of the men had on parts of their uniforms but no helmets and presented a ludicrous appearance. They lined up before the window of the station and were reviewed at that safe distance.

UTILIZING ELEVATED RAILROAD.—Chief Musham, of Chicago, favors the use of the elevated street railway for the fire department in time of emergencies. He wants stand pipes at short intervals along the elevated road in the downtown district, so that more efficient work can be done. He also desires a high-pressure system and apparatus which can be sent out on an elevated railroad train. Incidentally this would entail a device to shut off the current in the third rail in any block desired along the loop. With a motor car equipped with a ladder truck and hose wagon any blaze adjacent to the line could be reached in minimum time. At present when such fires occur the firemen are often hampered by the railroad structure in the street. It is dangerous for the men to work from the structure, as their lives are threatened by the electric current. Many times a hose could be played from the elevated structure upon a burning building to good advantage.

DUBLIN POLICE MUST BE EDUCATED.—On account of the dissatisfaction that has existed in the police force of Dublin, Ire., regarding the system of promotion, it has been decided to allow the men to pass their literary examinations while they are young. Heretofore the men could only have their literary qualifications passed upon shortly before promotion and this is a hardship and handicap to those men who have been a long time on the force and have gotten out of the habit of study. Now it is proposed to allow all men having served at least five years to take their examinations and be graded into one of three classes. They can pass from a lower to a higher grade when qualified. While promotion in the department will depend on a man's merits in the discharge of his duties and the ability to enforce the rules of the service, no one can be promoted to a higher rank unless he holds a certificate showing that he possesses a degree of education necessary for that rank. This rank is to depend on the grade to which he has attained.

PENSIONS FOR POLICEMEN.—The town of Brookline, Mass., may now accept the act of the Legislature relative to pensioning policemen and firemen. The matter has been in abeyance for several years, but has been brought up lately on account of the accident to one of the drivers in the fire service. He was permanently injured and has no means of support except what a pension would bring him. A proposition has been submitted to the Legislature of New Jersey relative to the pensions for the police of Atlantic City. The measure requires that the funds for the pension fund be provided by paying into the fund 1 per cent. of the salaries of the policemen and in addition to this all the moneys to the general police funds from fines for absence through illness or for other causes. When a policeman is off duty through disability he shall receive full pay from this fund. To help meet this the city will pay into the fund all money in salaries lost by police through absence. At the age of sixty, after twenty years of service, policemen will be retired on half-pay.

SCHOOL FOR POLICE AT MANILA.—A suggestion of several American cities is found in the project to establish a school for policemen. In Manila, P. I., the school is for the benefit of the native policemen. The police department has recently been reorganized, and by it weeding out was done, radical changes made and new features introduced. The old native force was abolished and a new enlistment made on merit alone. One of the prerequisites for membership on the force was the fluent use of the Spanish language on the part of the American members of the force and an equal proficiency in the English language by the native policemen. For the natives a school has been established where nothing but English is taught. As the natives become proficient they are promoted from probationary to regular policemen and eventually some of them will wear the sergeants' stripes or be in command of the stations, which include the Tondo station, the Santa Cruz, the Binondo and the Anda street station.

EFFICIENT SERVICE AT CHARLESTON.—Chief O. G. Marjenhoff, of the Fire Department of Charleston, S. C., has been kind enough to send us his annual report for 1901. He reports that the total expenses of the department for the year amounted to $51,947.17, that the total loss by fire was $1,376,734.18 on property valued at $15,518,966.70 and that the department answered 151 alarms. Chief Marjenhoff has at his service ninety-nine officers and men, ten steamers, a double tank chemical engine, ten hose wagons, an aerial truck, two other trucks, fifteen fire extinguishers and smaller apparatus and a complete system of fire alarm telegraph. All the hose that had become at all weak during the year had been sold and replaced with new so that there was no trouble at fires from bursting hose. The railway emergency wagon proved its value in responding to fires and rendering the electric wires harmless, thus enabling the firemen to attend to their work without danger. The Chief highly commends the value of the drill school which has been in operation for four days during each week.

FIRE SERVICE AT DETROIT.—Mr. George W. Stockwell, Secretary of the Fire Commissioners of Detroit, Mich., has favored us with a copy of the last annual report of the Commission. The general report contains reports of the different departments under the control of the Commission. The running expenses of the department amounted to $513,777.68, of which $443,865.58 was for salaries; $6,883 were spent on new hose. Chief Kendall reports that the number of fires was 899. The loss for the year 1900 was $596,633 on property valued at $5,283,820. The force of the department consists of 510 men, fifteen of whom are not uniformed. Of the others, besides the chief and assistant, there are six battalion chiefs, thirty-six captains, forty-one lieutenants, fifty-two engineers and assistants, 116 pipemen, sixty-eight laddermen, seventy-two drivers, etc. In the service there are twenty-four steam fire engine companies, two companies assigned to the two fire boats, twenty-four hose wagons, ten ladder trucks, three chemical engines and six supply wagons. In reserve there are kept four steamers, three ladder trucks, two hose carriages and three chemical engines.

BUREAU OF CRIMINAL IDENTIFICATION.—A number of the most prominent police officials in the country are urging Congress to pass a bill establishing a bureau of criminal identification as an adjunct to the Department of Justice. It is believed that this will do more to deter criminals than any measure that has ever been devised. This bureau is to take the place of the one in existence supported by subscriptions from the police departments from all over the United States. Measurements, photographs, descriptions and records of criminals are at the disposal of the subscribing departments and these departments keep the bureau informed of all new records that are obtained by each. By means of the new bureau proposed, a police officer in every city, village and town in the country at small expense could be kept informed by the central bureau as to the criminals in the country and their movements. This bureau would be better than those in Europe in that it would not depend on measurements and photographs alone, but also on information of a special as well as of a general criminal nature concerning persons here and abroad.

AN ICE-BREAKING FIREBOAT.—A new development of the famous ice-breaker principle has just been tried, with satisfactory results, at St. Petersburg, Russia. The great expense of an ice-breaker is much increased by its comparative usefulness during the months in which it is not performing its special functions. In order to obviate this the new ice-breaker, which will be sent to Astrakhan, has been adapted for use as a fire preventing steamer. The disastrous fires which occur among crowded shipping at the Volga stations every year have been the cause of enormous losses, and it is hopeless to attempt any rescue of property from the shore. The new boat is adapted for forcing its way in among a burning fleet of river boats, and can with its ram sink such as are hopelessly gone or are a danger to their neighbors. As an ice-breaker the new vessel is practically the same as the former patterns, but instead of producing the necessary changes in equilibrium by pumping water into the various compartments, it uses for this purpose the naphtha refuse which is employed as fuel for the engines. The same pumps, which are necessarily very powerful on an ice-breaker, are used for water when the boat is employed as a fireboat.

TO GUARD AGAINST FUTURE CONFLAGRATIONS.—The recent large fire at Atlantic City, N. J., has caused a shower of suggestions to fall upon the heads of the mayor and officials as to the methods to pursue in the future to guard against a repetition of the disaster. To the officials, however, the signing of the charter by Governor Murphy will do more than anything else to make Atlantic City immune. The council will now have the power to formulate proper building regulations which will guard against the erection of all but fire-proof structures in the future. City Electrician Farrand says that the success of the fire department depends on quick service more than on the number of engines in use. Anything that will enable the engines to arrive at the source of fire as soon as possible will do the most good for "one good stream in five minutes from the time the box is pulled is worth twenty streams thirty minutes afterwards. Any fire that is not under control within thirty minutes after the apparatus is on the ground is liable to be as disastrous as that of recent date." He says that a combined chemical and hose wagon should be in every engine house.

WORK OF THE LONDON FIRE DEPARTMENT.—The work of the fire department of London, Eng., during the year 1901, has been brought out in the report of the Chief Officer, Captain Wells. There were 3,684 fires in the city, of which ninety-nine were serious. Chimney fires and false alarms are not included in the larger number. The average for the past ten years has been 167 fires of a serious nature and thus the last year has seen a great reduction of large conflagrations. The number of lives lost, while larger than that of the preceding year, was much smaller than that of two years ago. The strength of the department, exclusive of the chief, is made up of second and third officers, six superintendents, seven district officers, seventy-three station officers, 147 first-class, 133 second-class and 598 third and fourth-class firemen, 36 men under instruction, 17 pilots and 153 coachmen. There are sixty-five fire engine stations on land, four floating stations on the river, and seventeen stations that have no horses. The apparatus consists of sixty-eight steamers, five steamers on barges, twenty-one manual engines, 104 hose-carts, five steam tugs and forty miles of hose. There are also 174 hand fire-escapes, two emergency ladders, thirteen long fire ladders, fifty-five ladder vans, 260 horses, 694 fire-alarm boxes and 129 telephones to public and private buildings.

FIRE AND POLICE PERSONALS

—Oren B. Bates has been re-elected Chief of Police at Clinton, Mass.

—Richard M. Whitman has been appointed Chief of the Police Department of Reading, Pa.

—Mayor Hoyer of Altoona, Pa., has appointed Theodore Alleman Chief of the Fire Department.

—Mayor McCormick of Harrisburg, Pa., has appointed Lieut-Col. Joseph B. Hutchinson Chief of Police of that city.

—Billings, Mont., has shown its appreciation of its fire chief, Captain J. C. Bond, by increasing his salary from $25 to $75 a month.

—Mayor Price has appointed John W. Jones Chief of Police of Wilkesbarre, Pa., and Joseph G. Schuler Chief Engineer of the Fire Department.

—Frank A. Matthews has been promoted to the position of Chief of the Providence (R. I.) Police Department, succeeding Chief Reuben R. Baker.

—Chief George Speidel, who has been at the head of the Middletown (O.) Fire Department for the past ten years, committed suicide last month by shooting himself with a revolver.

—Fire Chief Robert D. Cline of Wheeling, W. Va., has been thoroughly vindicated of the charge of attempted bribery. He was indicted for offering bribes to councilmen, but the trial showed that the charges were not founded on fact.

—Daniel J. Eckels, the veteran musical genius of the Pittsburg (Pa.) Fire Department, passed away on the 14th of March. He was sixty-three years of age and had been many years in the fire service. At his death he was superintendent of the department's machinery.

—Chief Nathaniel N. Murphy of the Bay City (Mich.) Police Department, will soon round out a quarter century in the service. When a boy he ran away to enlist in the Union army and served through the War of the Rebellion. He was appointed to the police force in 1881.

—Captain Bernard J. Ward, who was in command of the Southern Police district of Baltimore, Md., and who was dropped from the department by the commissioners without any charges being brought against him, won his case in the highest courts and will now be reinstated in his former position.

—Chief Croker of the New York Fire Department has received a letter of thanks from a New York firm for the services he and his department rendered in a recent fire in the firm's factory. They said the work was done so admirably and was so much appreciated that they found difficulty in expressing their appreciation of it.

—Chief of Police Austin of Birmingham, Ala., has decided to take a hand in having the streets and alleys of the city cleaned and the garbage taken away promptly. Patrolmen are to make reports of all violations of ordinances and to see that the sidewalks were kept clear of boxes and barrels.

—Chief Willis of the Police Department of Windsor, Canada, is doubtful whether to be glad or sorry over the great improvement in the conduct of the city. The only cause for regret is that business has been so poor for the department that the amount of fines collected is very low and the force will have to hustle to make as much for the city as in the previous years.

—Chief Benjamin Murphy of the Jersey City Police Department showed his kindness of heart last month by personally purchasing an old horse that had once been the pride of the department. "Old Ben" was the first horse to run on the ambulance and, when it was decided that he was too old for further service, the Chief determined to save him from further drudgery. He purchased him at auction and had a veterinary surgeon put him to death painlessly.

—The police of Jersey City, N. J., last month produced a play for the benefit of the Jersey City Police Mutual Aid Society, written by Chief Benjamin Murphy. The name of the play was "Scenes in a Station House." The chief's idea was to portary scenes as they occur in well regulated police stations. The chief not only wrote the play but also assigned the various parts to his subordinates who performed their parts with great success. About 10,000 tickets were sold for the performances, which continued through a week.

CURRENT LITERATURE ON MUNICIPAL TOPICS

Reviews of Some Important Books—What the Magazines and Reviews Have to Say About Civic Affairs—Municipal Reports Received

PERIODICALS

In the issue of the *Sanitary Inspectors Journal* for March, 1902, appears an article on *Notes on Disinfection and Disinfectants* by C. T. Kingzett of about 5,000 words. The author discusses the definition of practical disinfection; the different kinds of disinfectants, whether liquid or solid, and the many patented articles in each class. He speaks of the great value of watering the streets thoroughly as a means of washing away much of the filth and disease germs and so making the use of disinfecting chemicals less needed; how drains should be treated and what measures should be taken to cleanse and disinfect the homes. London, England. Price per copy 6d.

♣

The Surveyor for March 21 contains an article on the *Maidstone Electricity Works,* giving a full description with illustrations of that English city's source of light and power. While this municipal plant is not very old, it proved a great success. London, England. Price per copy 3d.

♣

A new method of determining the fire resisting qualities of fireproofed wood is explained in an article by Prof. Ira. H. Woolson of Columbia University, on the *Testing of Fire-proofed Wood* which appeared in *Engineering News,* and from which extracts were made for the March issue of *Insurance Engineering.* The writer made over 400 separate tests under this method, and the results obtained are given in this paper. He points out that the processes of treatment do not make the woods fire-proof, strictly speaking, but simply fire-retarding and the questions to decide are, what degree of "fireproofness" or fire resistance in the products of the "wood fireproofing" process shall be required and what kind of test shall be applied to determine if the specification has been maintained. New York, N. Y. Price per year, $3; per copy, 25 cents.

♣

In the March number of the *Proceedings of the American Society of Civil Engineers* appears a paper by George S. Webster and Samuel T. Wagner on the *Pennsylvania Avenue Subway and Tunnel, Philadelphia, Pa.* The whole article is treated thoroughly from a technical standpoint, involving the engineering features of the work. The article is of such a length that all the important details of the undertaking are touched upon and many drawings and several photographic productions add to the value of the article. New York, N. Y.

♣

How Cleveland Stamped Out Smallpox is the subject of an editorial in the March number of the *Arena.* It contains a statement by Dr. Friedrich, the Health Officer of Cleveland, O., telling how he reduced the number of cases of diseases in his city by a thorough and systematic campaign of disinfection of all premises and the surrounding districts where cases of disease appeared. The testimony of Dr. Knaggs of London, England, is included in the editorial, and it is claimed that this physician has the greatest faith in the efficiency of sulphur in time of smallpox contagion. This is due to the fact that it is impossible to vaccinate one successfully who has taken sulphur. Consequently the question is asked; if sulphur renders one immune against vaccine, might not this fortify one against the smallpox germ? New York, N. Y. Price per year $2.50; per copy 25 cents.

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According to William R. Lighton, in the April *Atlantic Monthly,* the city of Omaha is little more than a big aggregation of little towns. His article, *Omaha, the Prairie City,* does not deal gently with that Nebraskan town, although he tries to put the facts as easily as possible, but the "truth's the truth for a' that." He first tells how the city came to be established in 1854 and its remarkable spread in territory, much too fast for it to retain the dignity of a city throughout. At present the simplicity of the village is interwoven throughout the city's limits and, while this will gradually be eliminated, the city at the present is a conglomeration of rural and urban life.

The railroads built Omaha just as they have done other western towns. "Omaha stands for the life of the prairies, to which it owes its own life. . . . It is not a cosmopolitan city,—in the nature of things it cannot be; at its greatest and best it must be and remain a farm town, with all that that implies."

Between 1885 and 1890 all the west was in the state of a "boom" and Omaha did not escape the fever. It outran all sober judgment and sense and the craze for a big population and as many as possible of the surrounding towns and land was included in the city's limits. The census of 1890 gave a population of 140,000, but that of 1900 but 103,000, showing that the former figures had been "padded" for political purposes. The position of the city did not warrant such an increased spread of territory for "Omaha makes its living only as a sort of corporate middleman for the tenants of the tributary farms; and as this business is limited to a certain volume, its profits will not support an unlimited number, no matter how loudly the ambitious people may whoop about it." Omaha suffered more than most of her sister cities from the inauguration of a system of municipal government which was too large for the work necessary to be done. It needed no such elaborate scheme of government for it was nothing more than "an overgrown country town." The city was extended to include about twenty-five square miles over which was spread a network of "improvements" which imposed upon the people a bonded debt of $5,000,000. At present there are entire quarters of farm lands lying within the limits, planted with crops, but subject to regular municipal taxation and the burden has ruined more than one citizen. There is no municipal ownership of public utilities. The franchised companies are making lots of money from the city. On the hilltops, five miles from the original place of settlement on the river's bank, is a district dedicated to vice, for Omaha feels that, to be a real city, "it must indulge in all those forms of viciousness which contribute to the appearance of cosmopolitanism." The city presents the appearance of a checker board. A half-mile of stately avenue lined with fine residences and paved with asphalt is suddenly succeeded by a stretch of dirt road, wooden sidewalks and open fields. This is again followed by a section of citified street with beautiful trees and pretentious residences.

The desire of the city is to appear "cultured," but it only succeeds in "being up-to-date." There are no public art galleries or museums. "The best thing that can be said about the place is that beneath the frothy, false surface there is a deep and strong current of moral integrity." When it is considered that the place is but forty-eight years old and in view of the strides that have been made already, it is safe to presume that the future is in safe hands. Boston, Mass. Price per year $4; per copy 35 cents.

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The Taxation of the Corporations in the United States which appears in the March issue of the *Annals of the American Academy of Social and Political Science,* is an attempt to deduce a method whereby a system of taxation may be so arranged that the people will get at the real value of the corporation holdings outside of the real estate. In discussing the subject three methods are considered. The taxation of net receipts, the taxation of tangible wealth plus franchise and the taxation of the concern on a valuation equal to the sum of the values of the stocks and bonds. The first method reaches the income of the stockholders but not the bondholders; the second reaches the whole effective income capacity of the business, but does not properly adjust the burden between the stockholders and bondholders; in the third case the same difficulties arise. The author, Francis Walker, takes up each method and shows the trouble that lies in each.

The subject of Federal control of corporations which would take them out of state jurisdiction is considered and apparently finds favor with the author. He concludes that the correct economic principle should first be established and this is found, according to his argument, "in taxing business undertakings where the business is carried on, and the persons at their place of residence on their consumption. The present confusion in state and national finances arises very largely from a lack of harmony in theory, though the present rule seems to be the goal to which we are working. . . . The enlargement of Federal control is a matter of necessity in many ways, and the need of it will become more and more urgent as the economic relations of different parts of the country become more intimate and the organization of business more centralized." Philadelphia, Pa. Price $6 a year; $1 a copy.

S. E. FORMAN writes on *Public Schools and Good Government* for the March issue of *Gunton's Magazine*. He says that it is not certain that the public school system is doing all it should do for the cause of good government. "The teachings of what is called civics, but what is nothing more than civil government, is postponed to the last years of the high school, where less than 4 per cent. of the total enrollment can be reached." Thus millions go to the ballot box with no knowledge of the principles of good government. The masses have only their school days to acquire this knowledge. The elements of political and economic science if installed into the growing generation, will do more than anything else to secure an enlightened electorate. The author maps out a plan of instruction to begin in the grammar and extend throughout the high schools whereby the pupils will become thoroughly familiar with the problems of politics without acquiring partisanship. Lessons in ethics must be closely combined with those in civics. Inasmuch as the present curriculum of schools is already crowded with subjects, some of the many languages or sciences must give way to the vastly more important study of civics. After the three R's, the study of civics is of most importance. New York, N. Y. Price per year $1; per copy 10 cents.

In the May *Century* is an article by Sylvester Baxter on *Village Improvement*. Mr. Baxter says that "whatever is the most characteristic element in the scenery of a place should stand first in the scheme of recreative open spaces; thus, if a river, let there be a terrace, promenade or drive, treated either formally or in a natural way according to circumstances; if there be a lake, let there be laid out a pleasure ground on its shores; if, on the other hand, the region is a rolling country a varied scene may be secured." Spacious expanse of level country may be varied by woody margins, etc. A factory town, in which water supplies the power, will have above the dam a considerable area of slack water that invites boating. The banks of this stretch of water may be cleared of the usual ugly intrusions and laid out with vegetation which will soon present a natural appearance; thus a delightful pleasure ground may be created. New York, N. Y. Price per year $4; per copy, 35 cents.

MUNICIPAL AND OTHER REPORTS

THE following reports have been received and will be reviewed from time to time when space permits:

Annual report of Rockford, Ill., through the courtesy of Edwin Main, City Engineer; report of City Treasurer John B. Shaw of Jamestown, N. Y.; report of the Expert Accountant of Brookline, Mass.; the eighth inaugural address of Mayor Charles S. Ashley of New Bedford, Mass.; report of Chief Engineer George W. Horton of the Fire Department of Baltimore, Md.; report of Charles M. Slocum, City Engineer of Springfield, Mass.; report of Charles A. Brown, Superintendent of Streets, Cambridge, Mass.; eleventh biennial report of the Bureau of Labor Statistics of Illinois, David Ross, Secretary to the Commissioners; reports of water commissioners of Bradford, Pa.; Clinton, Mass.; Johnstown, N. Y.; Leominster, Mass.; reports of the park departments of Minneapolis, Minn., and New Bedford, Mass.

We have also received the proceedings of the eighth annual convention of the American Society of Municipal Improvements held at Niagara Falls, N. Y., October 1-3, 1901, and the official report of the sixth annual convention of the International Association of Municipal Electricians, held at Niagara Falls, N. Y., September 2-4, 1901.

There have come to hand a copy of the contract and specifications for the filters, basins, etc., for Contract 1 of the Pittsburg, Pa. water works compiled by Bureau of Filtration; a copy of the contract between the city of New Bedford, Mass. and the New Bedford Gas Company; reports of the Committee on Water of New Haven, Conn., relative to the new contract with the water company.

THE voluminous report of Mr. Edward A. Bond, State Engineer of New York, shows the great amount of work that has been done in Mr. Bond's department and under his supervision during 1901. After telling of the work done on the canals of the State, Mr. Bond reports on the work done to improve the highways. As regarding to the use of wide tires he says, "As to the desirability of the use of wide tires there can be no question." Road materials have been tested as to their utility for different kinds of roads. Concerning the employment of convicts on roads he says that the prisoners could be used to prepare the roads for macadamizing so that contracts could be made with contractors at a much smaller figure. Many half-tones show the work that has been done during the year. Among the sub-reports is one on the "Discharge of Streams in the State," which was undertaken in co-operation with the United States Geological Survey.

Sewers

NEW ORLEANS, LA.—The fourth semi-annual report of the Sewerage and Water Board of New Orleans, La., for the period between July 1 and December 31, 1901, tells of the work that has been done towards acquiring the sewer properties of companies in the city and the acceptance of the property as being in good condition and fit to be added to the system of sewers. The work of the board has been directed towards developing in detail the plan for the new sewer systems. The General Superintendent of the Board, Mr. George C. Earl, has investigated the water purification systems in other cities and considers that the muddy water of the Mississippi River is pure from a biological standpoint and can be filtered and used by the city with safety.

Lighting

DETROIT, MICH.—Some interesting statistics are given in the semi-annual report of the public Lighting Commission of Detroit, Mich., for the six months ending December 31, 1901. The President, Mr. David W. Simons, calls attention to the fact that the cash outlay per arc light for the half year of $20.10 is the lowest cost yet reached in the history of the plant. The total receipts for the six months aggregated $146,111.10, the total disbursements, $125,552.62, leaving an excess of receipts of $20,558.48.

The total output to December 31, 1901, amounted to $2,130,594 kilowatt-hours as against 2,027,733 kilowatt-hours up to December 31, 1900. The cost of operating the plant for the six months was $15,114.87, made up of $5,969.97 for maintenance, $4,309.38 for executive and $22,678.67 for station, including wages. The total cost per kilowatt-hour per lamp was $0.02258 as against $0.03055 for the six months to December 31, 1897. The grand total of wages for the six months was $28,521.81, $3,813.74 less than for the corresponding six months in 1898.

Of the output of $2,130,594 kilowatts, only 308,440 were for incandescent lighting. Per kilowatt-hour, the amount of coal consumed for the last six months was 4.92 pounds, a saving of .15 pound over 1897. The coal, however, cost $2.05 per ton during the last year and only $1.97 in 1897.

During the last six months the average number of lamps in use was 2,048, the number of hours that they burned amounted to $3,941,235 and the cash cost per arc lamp averaged $3.35 per month.

AIR BRAKES AND ELECTRIC CARS

A Modern Necessity—Different Forms Invented—Popularity of the Christensen—A Matter of Economy and Safety—Now Used in Many Countries

THE use of air brakes upon electric cars has become a necessity. Yankee genius has risen to the occasion and produced an air brake which is destined to supersede the hand brake. This invention marks one of the engineering successes worthy of note. Municipal officials everywhere will be performing a public duty if they insist upon the early installation and universal use of the air brake upon all electric cars within city limits. The heavy cars and high speeds that have come into use as a result of the introduction of electric power, have created a demand for a quicker and more reliable method of stopping a car than that provided by the old hand brake and, therefore, the air brake has become a modern necessity.

Various forms of friction, hydraulic, electric and air brakes, many of which had been tried and discarded by the steam roads, were tried on electric cars. Few of these ever reached the stage of practical use however. One after another has been eliminated until today, just as in the case of the steam roads, the air brake is in use with a very few exceptions on the cars of all electric roads that have adopted power brakes of any kind.

THE ADVENT OF THE AIR BRAKE

A number of different forms of air brakes, in which the axle driven compressors were used were brought out between 1889 and 1895, including the one invented and patented by Mr. N. A. Christensen. The Christensen equipments were installed and operated with entire satisfaction on cars of the Citizens' Railway Company of Detroit, Mich., in the summer of 1893 and, later, on cars of numerous other roads. Mr. Christensen, however, saw the necessity of something better than axle driven compressors and in April, 1896, his first independent motor driven air compressor was put in operation on one of the cars of the Metropolitan West Side Elevated Railway Company in Chicago. An automatic governor was also supplied which was arranged to open the circuit of the motor as soon as the pressure reached a predetermined maximum and to close it when the pressure was reduced to a predetermined minimum. This first equipment was a complete success and similar apparatus was soon installed in various parts of the country.

ONE OF THE MAIN AISLES IN THE MACHINE SHOP

The Christensen Engineering Company was organized in 1897 and they found it necessary to increase their manufacturing facilities from time to time. Finally, in 1899, the demand for the company's apparatus became so great that it was decided to secure a new site and erect a new plant. The works are located near River Park, Milwaukee. No expense was spared in installing the most modern equipment obtainable and the company's facilities are now such that the constantly increasing demands can be promptly met.

GREAT POPULARITY OF THE CHRISTENSEN

The rapidity with which the authorities of electric railways have recognized the value of the Christensen independent motor driven compressor is indicated by the fact that over 95 per cent. of all the electric roads that have adopted power brakes of any kind, are equipped with the Christensen apparatus, and there are now over 5,000 equipments in daily service.

The following detailed description of the compressor used with these equipments will be of interest to many of our readers. The motor and compressor combined, as shown in Figure 1, consists of a series wound motor and a duplex, single acting compressor provided with two pistons which are connected by wrist pins to the connecting rods engaging with the crank shaft. This crank shaft is mounted in bearings provided in the case, the extended end of the crank shaft carrying a helical gear which engages with a helical pinion mounted on the extended end of the armature shaft of the motor. The latter is mounted directly above the compressor, the motor base forming a top cover for the compressor. This arrangement enables all the working parts to be run in oil. The suction and discharge valves are of seamless cold drawn steel and are interchangeable one with the other and separately accessible. The armature bearing at the pinion end is so arranged that it is constantly lubricated by the oil within the casing of the compressor and is provided with an automatic overflow arrangement. The brush holder of the motor is of the simplest possible construction and is provided with an instantaneous adjustment. The armature bearings are so designed that it is impossible for oil to get into the armature. The combined machine is of extreme simplicity, requiring a minimum amount of attention as there are only two places for oiling, one being the main casing of the compressor and the other being the oil well on the armature bearing at the commutator end, both of which need replenishing only at long intervals. The helical gear is very much more durable than ordinary gears and practically eliminates noise.

The Christensen governor, shown in Figure 2, consists of an ordinary Bourdon pressure gauge mechanism with a special hand, which upon coming in contact with a conducting stud at the position of minimum pressure, allows current to flow through a magnet coil which is provided with a plunger, to which the contact pieces for

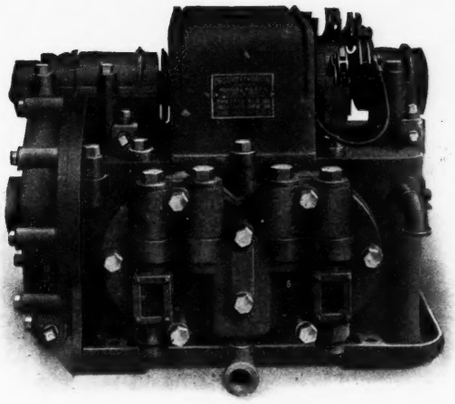


FIG. 1.—MOTOR DRIVEN COMPRESSOR

the motor circuit are attached, thereby starting up the motor. As soon as the hand strikes the maximum stud, current will pass through a second solenoid magnet, thereby pulling the magnet plunger in the opposite direction and opening the motor circuit. By this mechanism it is possible to get a close margin between maximum and minimum pressures. This margin is readily adjusted by moving the contact studs away from, or towards, each other. The details of the accessory apparatus have been as carefully designed and accurately constructed as the compressor and governor.

THE AIR BRAKE GIVES PERFECT CONTROL

Cars supplied with the Christensen air brake equipments are always under perfect control, quick stops can be made, accidents prevented and schedule speeds increased; flat wheels are prevented and life of cars and brake shoes greatly increased.

The economy of air brakes was clearly shown recently on a test made upon two cars of equal weight and size, operating on the same road, at the same time under equal conditions, excepting that one was equipped with a Christensen motor driven compressor air brake and the other with hand brakes only. The result showed that the former used from 10 to 18 per cent. less power than the latter. This was caused by the motorman dragging his brake shoes and was due to the almost universal practice of motormen holding their brake handles in such a position that they can quickly apply the brake when approaching curves or running through crowded streets.

The policy of the Christensen Company from the start has been not to place any device upon the market until it has been perfected and proven reliable and durable in long, thorough, and severe tests under the conditions it will meet in actual service; in other words the company and not the customer pays for the experimental work.

That this policy is recognized and appreciated is indicated by the fact that orders have been received since the first of the present year for more than twice as many Christensen equipments as were ever sold before in an equal period of time.

The Christensen equipments are not only used on electric cars in the United States but also in England, France, Germany, Sweden, Norway, Russia, Africa and in fact wherever electricity has been adopted as a motive power for cars.

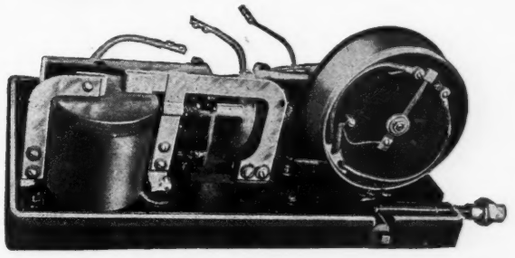


FIG. 2.—AUTOMATIC GOVERNOR FOR CHRISTENSEN MOTOR DRIVEN COMPRESSOR

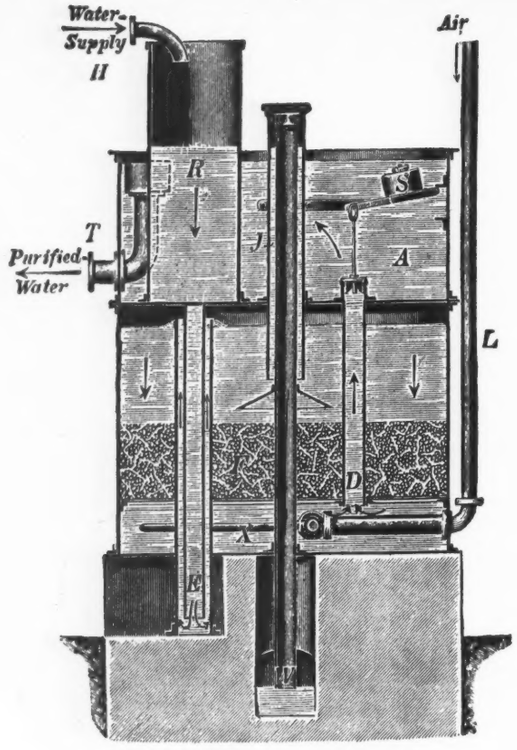
One of the orders recently received was for fifty motor driven equipments to be installed on cars belonging to the Government Tramways in Sydney, Australia. This was a repeat order, the same road having previously had 127 Christensen equipments in operation.

A NEW SYSTEM OF MECHANICAL FILTRATION

THE pollution by sewage and refuse from manufactories, of the rivers and small streams in the United States, has much to do with increasing the death rate and constitutes a problem of serious proportions. When it is taken into consideration that many cities, towns and villages secure their supply of water from these small streams, the reason why an immediate solution of the problem should be obtained, is apparent. While it is possible by means of state and local legislation to partially remedy the evil by preventive methods, practically the only means left for insuring a pure water supply is found in some filtration process. What interests one municipality in this particular will interest all, for every city, town and village is vitally affected. The critical situation is fully realized by some state boards of health and some municipalities, but not by all. Some good laws have been framed to fit the needs of different localities. Millions of dollars have been expended by states, counties and municipalities in an endeavor to insure a supply of water particularly for domestic purposes, which shall be pure and wholesome. This is a problem which must be solved for it is of vital importance. Water we must have and it must be pure. The cities of the Old World settled this question many years ago, and for half a century have been using filters for purifying their water supplies. It is only within the last decade or two that American cities have awakened to the necessity of purifying their water supplies. Two well-known methods have thus far been introduced in this country; one, known as the slow sand filtration process; another is the mechanical filtration process. A third filter, known as the improved automatic mechanical filter is now offered by the Automatic Water Purifying Company, 45 Broadway, New York City. This Company holds the patents of the celebrated Reisert automatic sand and gravel filter, which has been used successfully in Germany and other European countries. More than 650 plants are in successful daily use in Germany alone. Most effective work has been performed by these filters on the Continent, and there is no reason why they should not be used in this country. The fact that American capital has been interested in the introduction of so valuable a municipal adjunct is sufficient guarantee of the efficiency of the filter. This system can be adapted to the smallest village or the largest city. Some of its advantages are: (1) a large amount of clean water can be obtained with a relatively small apparatus; (2) the filtering material and special gravel need never be renewed; (3) very little time is consumed in cleaning the filter. Other mechanical filtration systems have complicated arrangements and require much time to clean their filters, an operation which has to be repeated at short intervals. They are also too bulky.

The use of the patent air compressor in the Reisert system gives it a great advantage over others. It performs its work most thoroughly and keeps the interior of the filter absolutely pure and clean. Of all other systems which use a simple back flowing of the water for cleansing purposes, it has been found quite inefficient for the washing of the filter bed, because the back flowing water forces a passage through the weakest part of the filtering material and runs through it with scarcely any effect so that large parts of the filtering material remains still impure. Only by a simultaneous and regular distribution of compressed air beneath the filtering material is it rendered possible to secure its rapid and complete cleansing.

Our readers will be interested in a more detailed description of this new filtration system. In construction the casing of the filter may consist of iron, wood or cement masonry, and its inner space is divid-



ed into three divisions by the insertion of two floors. The lower floor of perforated sheet-metal and gauze serves as a bed for the filtering material which consists of fine-grained gravel. Over the upper floor there is placed the pure water reservoir, whose contents are destined for cleansing the filtering material. The whole arrangement is shown by the accompanying illustration.

The process of working is as follows: Through the pipe H, water to be purified first flows into the cylinder R, and thence, descending through the pipe E and re-ascending through its casing over the filter, passes through this, and ascends through the pipe D and its semi-open valve into the pure water reservoir A, whence it leaves the apparatus through the pipe T.

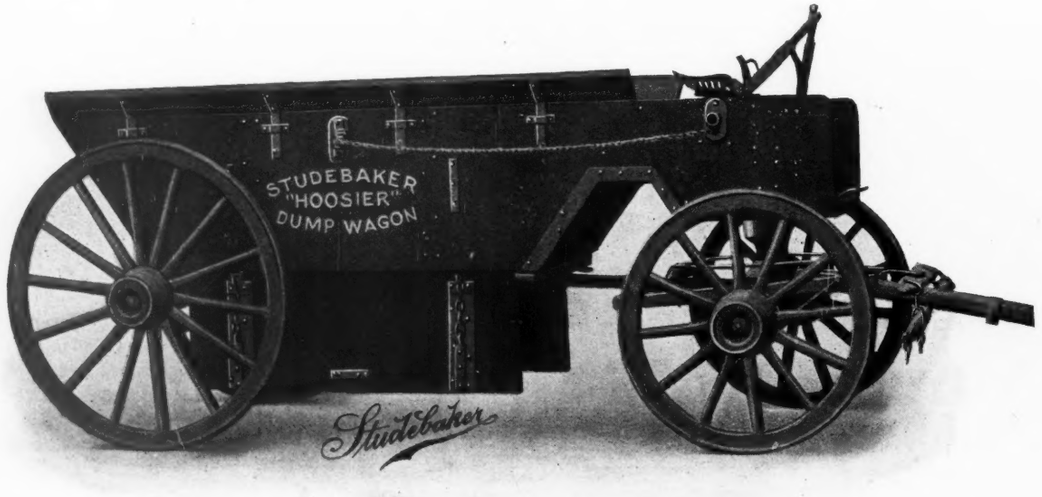
In the event of the filtering material becoming impervious through being choked up with mud, the level of the water rises in the cylinder R and consequently, also in the syphon pipe J (which is hermetically closed at its top) to the upper edge of the centrally fixed pipe, which, below, dips into a water level. The syphon then acts, and, through the air tube L, energetically sucks i air which, by means of the tube system X, is uniformly distributed under the filter-bed. The air rushes through the filtering material, and loosens all the mud particles. At the same time pure cleansing water from the reservoir A passes, by means of the pipe D and its semi-open valve, through the filtering material. As soon as the water in the reservoir A has sunk to a certain level, the float S opens the valve completely and the admission of air ceases, while larger quantities of water pass through the filter as a final cleaning. When the pure water reservoir A is quite emptied, the syphon becomes disconnected and the process of filtration begins anew.

Filters with iron casings are constructed to any size up to a capacity of 11,000 gallons per hour. Filter installations of a greater capacity are arranged in the form of a battery of such filters. On the other hand, however, filters may be erected with a casing of cement masonry or beton, up to a capacity of 13,000 gallons per hour per each filter, and may be formed into a battery up to the greatest capacity desired.

A more complete description of this system may be had by applying to The Automatic Water Purifying Company, 45 Broadway, New York City. This company is not only prepared to build filters, but also water works and gas plants, sewage systems, etc.

THE "HOOSIER" DUMP WAGON

THOSE municipal officials who have to do with the collection and disposal of garbage, street sweepings, or other material, will be interested in the accompanying cut and description of the Studebaker "Hoosier" Dump Wagon. This wagon dumps from the bottom by means of an ingenious device operated by levers, without the necessity of the driver leaving his seat. The bottom is closed with ease while driving from the dumping ground without stopping the team, the wagon being made ready for reloading while in motion. The wheels have wood hubs. The front wheels are thirty-eight inches high and the rear ones fifty inches high. The size of the tire is three and one-half inches by one-half inch. The wagon is fitted with a drop tongue. It is well painted; the gear being red and the body green. It is shipped complete with wings, neck-yoke and wiffletrees. The only extra is the steel lining. The capacity of the box is two cubic yards. Information about the price of this and other wagons manufactured by this company will be cheerfully furnished by applying to the Studebaker Brothers' Manufacturing Company, South Bend, Ind.



A DUMP WAGON WHICH IS POPULAR WITH MUNICIPALITIES AND CONTRACTORS

TO INTRODUCE BITUMINOUS MACADAM

TACOMA will introduce Warren's bituminous-macadam pavement this summer. If it gives reasonable satisfaction and its cost is not greater than asphalt it will come into general use here. A few months ago a representative of Warren Brothers, of Boston, visited Tacoma and presented such strong recommendations from Eastern cities for this kind of paving that the authorities decided to give it a thorough trial at the first opportunity.

At a recent council meeting it was determined to pave I street, in the residence section, from Division avenue to North Thirteenth street, a distance of 5,000 feet. City Engineer Taylor is now preparing plans and estimates of the work and stated to me that bituminous-macadam would be used unless its cost should prove in excess of the price at which asphalt can be laid here. The paving on I street will be forty feet wide, with a street railway track in the center, and cover approximately 20,000 square yards. The street is comparatively level along the distance to be paved, with one incline about half a block in length that has a grade of 6 per cent.

A committee of the Council has recommended the paving of St. Helen's avenue for two blocks in the business district. It was at first proposed to use fir blocks, but as the grade there is considerable City Engineer Taylor has recommended that bituminous-macadam be used instead to prevent the slipping of horses' feet. His suggestion will be adopted, as bituminous-macadam is highly endorsed for combining smoothness and durability with sufficient resistance to afford a good foothold.

It is stated that the Warren Brothers' Company will shortly establish a plant on the Northwest coast for the manufacture of bituminous-macadam paving, so as to supply the increasing demand for it in this section of the country.

AN OLD TIMER

THE Baldwin Locomotive Works recently celebrated two notable events in its career; the seventieth year of its existence and the completion of its twenty-thousandth locomotive.

In 1832 "Old Ironsides," the first complete locomotive manufactured at the works, was turned out and entered the service of the Philadelphia, Germantown & Norristown Railroad.

With its regular train of passenger coaches, "Old Ironsides" used to make thirty miles an hour, to the amazement of the people, who regarded the machine as an interesting and amusing curiosity, little dreaming that it, and its contemporaries, marked the beginning of an era of marvels and an age of commercial miracles.

It took a year to build this primitive machine, Matthias Baldwin himself doing most of the work. The price which he received for the locomotive was $3,500. "Old Ironsides" ran regularly between Philadelphia and Germantown in good weather, but in bad weather horses were used.—From "A Couple of Locomotives," by Ellis H. Eames, in *Four-Track News* for April.

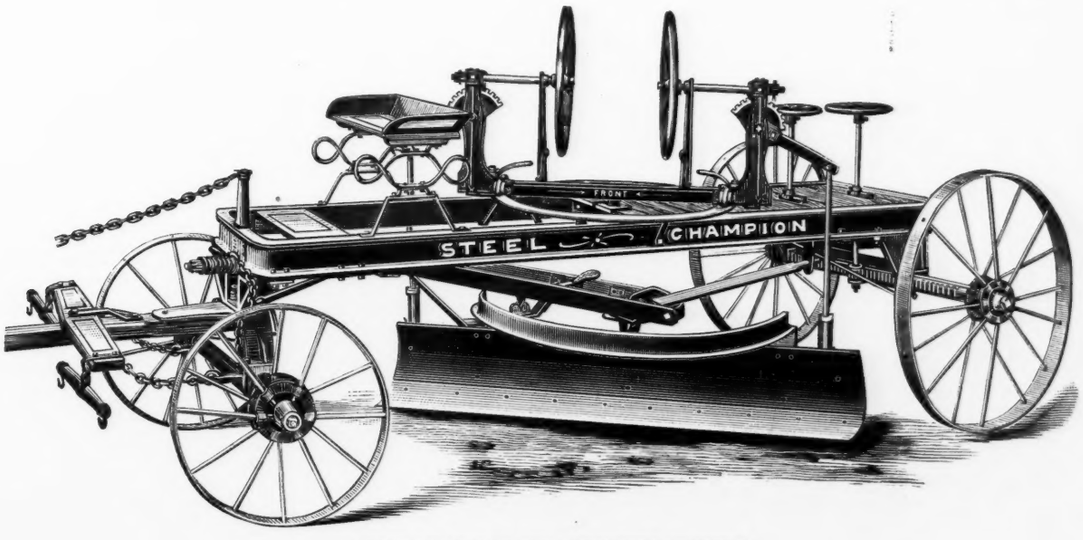
THE STEEL CHAMPION ROAD MACHINE

IN the persistent agitation for stone roads that has invaded every section of the country, the importance of keeping the earth roads in good repair is sometimes lost sight of. In this country a large mapority of the rural roads, and many of the outlying streets of cities and large towns are of common earth. In spite of the fact that hundreds of miles of stone roads are built each year, the earth road, like the poor, will be with us for years to come. The earth road, at its best, is never high grade, but by the exercise of judgment and by the use of improved machinery it can be kept in good condition for the greater part of the year, while if neglected it becomes not only uncomfortable and costly to use, but an absolute menace to travel.

An earth road should be kept smooth and well graded at all times so that the surface water which falls upon it will quickly flow off and be carried away. To do this economically it is necessary to use the best machinery.

One of the most practical machines for repairing earth and gravel roads is shown in the accompanying illustration. This machine, known as the Steel Champion Reversible Road Grader, is built almost entirely of steel and is therefore very durable. Four horses in light and six in heavier work will handle it to good advantage. Its adjustments are so easy and simple that any man of ordinary judgment can operate it to good advantage.

It is claimed for this machine that it will plow an even ditch, level and grade the road bed to a uniform curvature from crown to ditch, and accomplish these results at very small cost. This machine is not only used in repairing rural roads, but can be worked to advantage by contractors and city authorities in dressing up and repairing suburban city streets, cutting down the weeds that spring up at the sides of highways, and in scraping up dirt and refuse that collects on the surface of macadam streets.



A ROAD SCRAPER OF THE TWENTIETH CENTURY

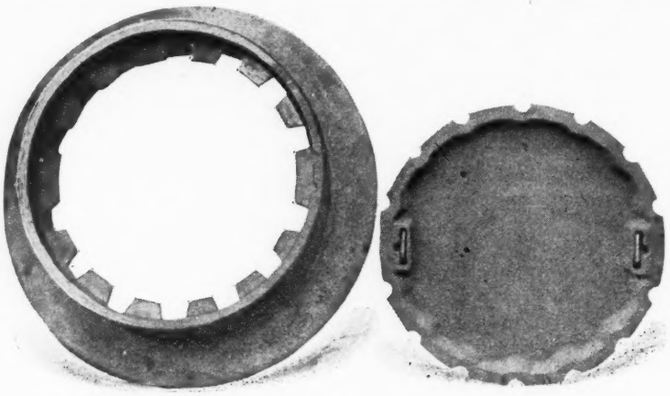
The Champion Road Machine is sold by the Good Roads Machinery Company of Kennett Square, Pa., who will be glad to quote price and furnish catalogues and full informatior on application.

THE INTERCHANGEABLE SEWER COVER

THESE are days when the opinion of specialists in any one line is worth more than that of theorists. The Greger Manufacturing Company of Philadelphia, Pa., has expert ideas and knowledge about manhole covers, sewer covers and all sorts of castings used in municipal engineering. This company has devoted years to the study of this general question, and for this reason any city will do better to take its advice than to depend upon local opinion as to the needs of a city in this particular direction.

For example, there is a choice between the round, the square or the oblong style of cover for sewers or manholes. Experience and long years of observation have shown that, all things considered, the round cover is better than the other two. This is especially true because pavements are not injured so often where a round cover and frame are used. This is especially true of sheet asphalt.

It is well known that open sand castings are much stronger than those made with a cope, therefore all the frames of this company are made in open sand, flange up, which gives the greatest strength where the greatest strain is felt. This arrangement also gives the bottom of the flange, where it comes in contact with the cement, a rough surface, making the bond between the bed of the manhole and the bottom of the frame very much stronger than would be the case with a smooth surface. In designing frames and covers this company always gives careful attention to the proper distribution of metal and lines of strain. By the use of corrected designs a saving of 30 per cent. of the metal has been effected, besides producing a stronger frame. It will interest the readers of THE MUNICIPAL JOURNAL, to know that this company stands ready at all times to give expert advice relative to the choice of the various types, frames, etc., of sewer covers and frames, or, in fact, about everything which comes



within the field of castings employed in municipal construction work. More than this, it is ready to give good reason for its opinion substantiated by facts. An attractive booklet is issued by the concern, which will be mailed to any address on application.

NOTES OF INTEREST TO THE TRADE

—The Standard Water Meter Company, 22 Reade street, New York, has received several large orders recently for its meters.

—Phillips and Worthington, 11 Broadway, New York City, have several large contracts for artesian wells and are looking forward to a busy season.

—The Diggs Fire Extinguisher Company, 141-143 Center street, New York, reports very satisfactory business and a rapidly growing demand for the "Diggs Upright."

—The T. A. Gillespie Company, 71 Broadway, has been awarded the contract for laying eight miles of five-foot riveted steel pipe, to connect the reservoir at Cedar Grove with the present system of Newark Water Works.

—The Seagrave Company, of Columbus, O., continues to turn out a large amount of up-to-date fire apparatus. Recent orders have been filled for Las Vegas, New Mexico, Nebraska City, Neb., Covington, Ky., and many others.

—We are in receipt of a beautiful catalogue published by The Emerson Pump Company, Washington, D. C. It has twenty-eight well illustrated pages and is protected by copyright. One can be secured by addressing The Emerson Pump Company, Washington, D. C.

—The Dickson Garbage Crematory Company of Toledo, Ohio, has just issued a beautiful forty-page catalogue with colored cover. It contains a full description, with diagrams, of its very efficient garbage incinerator. A copy will be sent to any address on receipt of request.

—The traveling public will be glad to learn that the damages to the Murray Hill and Grand Union hotels, caused by the explosion in Fourth avenue, January 27th, have been repaired, and both houses are now taking care of their patrons as usual.—From *Four-Track News* for March.

—The Kent Mill Company, manufacturers of the Kent wet and dry pulverizers and granulators for ores, cement, phosphates, sand and hard substances, formerly located at No. 5 Beekman street, New York City, removed April 30, to No. 170 Broadway. This change in address is made necessary by the large growth in the company's business.

—*The Four Track News*, Vol. 2, No. 4, is a well illustrated magazine of travel and education. In this, as in most other points pertaining to the management of the immense railway systems in this country, the New York Central takes the lead. It is well worth the five cents charged for it. Besides a lot of interesting reading matter it contains numerous illustrations which do illustrate the subjects admirably.

—The Sprague Company has recently issued an attractive bulletin, No. 301, which tells about Lundell Motors used for driving ventilator fans and blowers. The catalogue which tells about the Lundell fans is handsomely gotten up, beautifully illustrated, bound with a green cover printed in gold. Anyone addressing the Sprague Electric Company, 527 West Thirty-fourth street, New York, can secure copies of these publications.

—The Eureka Fire Hose Co., 13 Barclay street, New York, has made a change in its Pennsylvania agency, but its interests in that territory will still be cared for by Mr. Henry R. Early, who is connected with the firm of James Boyd & Bro., 14 North Fourth street, Philadelphia. This concern will hereafter carry a large stock of the Eureka Fire Hose Company's well known goods, and can execute all orders entrusted to them promptly.

—The Fan Motor catalogue of the Western Electric Company for 1902 presents a very artistic appearance. The design for the title page cover is very attractive, and the illustrations throughout are of a high order. Every type of fan which is used for cooling rooms in summer is fully described. A complete price list is also given. A request sent to the company, either in Chicago, St. Louis, Philadelphia or New York, will secure a catalogue.

—The recent improvements in the "Lancaster" dredges, grapples and clam shell buckets greatly increase their strength, efficiency and compactness as well as widening their scope of usefulness. They dig and rapidly handle materials too hard and difficult for any ordinary apparatus to penetrate. They are built entirely of steel and all bearings are bushed with phosphor-bronze. Full particulars, price-list and illustrated catalogue can be secured by addressing James H. Lancaster, 114 Liberty street, New York.

—The Montauk Fire Detecting Wire Company, 100 Broadway, New York, has just issued a circular giving names and addresses of some of the more important residences in which it has installed its local fire alarm service, and among them are found such names as the Hon. John Murray Mitchell, Charles T. Yerkes, Benjamin Stern, James H. Benedict, Joseph Pulitzer. The Manhattan Theatre and the American Museum of Natural History are among the list of public buildings, as well as several stores, mills, etc.